

E D E N
THIRD RESEARCH WORKSHOP
2004

Supporting the Learner in
Distance Education and E-Learning

Proceedings of the Third EDEN Research Workshop

Carl von Ossietzky University of Oldenburg, Germany

March 4 - 6, 2004

Edited by

Ulrich Bernath and András Szucs

on behalf of the European Distance and E-Learning Network
and the Programme Committee of the Third EDEN Research Workshop



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EDEN Secretariat
Budapest University of Technology and Economics
H-1111 Budapest, Egry J. u. 1
Hungary
Tel.: (36) 1 463 1628, 463 2259
Fax: (36) 463 1858
E-mail: secretariat@eden-online.org
WWW: <http://www.eden-online.org>

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Introduction

In 1998 EDEN initiated a strand of research activities as part of the association's strategy to support professional development in open and distance learning in general and EDEN's Network of Academics and Professionals (NAP) in particular. The First Research Workshop in Prague in 2000 on "Research and Innovation in Open and Distance Learning" was followed by the second in Hildesheim in 2002 on "Research and Policy in Open and Distance Learning". Now, in 2004, the third on "Supporting the Learner in Distance Education and E-Learning" is hosted by Carl von Ossietzky University of Oldenburg in Germany.

The theme of the Third EDEN Research Workshop addresses learner support as a central issue for success in education and training in general and in open and distance learning (ODL) in particular. The emergence of e-learning demands that we examine, analyse and develop our concepts and practices. Hence the objectives and structure of the conference and workshops in Oldenburg focus on research and innovative practice in the effective support of learners in distance education and e-learning. This provides the opportunity for an exchange of ideas, experiences, and best-practices in student support in ODL within the different and varying contexts of both the academic and corporate settings. A particular emphasis will be on recent developments in practice and its conceptualisation. It is also intended to strengthen the cross-cultural and international interchange of ideas and expertise with a particular focus on effective approaches to student support, the building of learning communities, and sustainable institutional models of best practice.

The keynote addresses given by Otto Peters (FernUniversität in Hagen), Nicholas Alan (University of Maryland University College), Alan Tait (The Open University United Kingdom), Gilly Salmon (The Open University United Kingdom), Elsebeth Korsgaard Soerensen (Aarhus University), and Terry Anderson (Athabasca University) will be followed by parallel discursive workshops based on 85 papers selected from more than 110 submissions from all around the world. The papers assembled in this book cover with almost equal emphasis the topic areas of the Call for Papers announced in July 2003:

Visions and principles of learner support: learner support as part of the institutional mission, from student to learner support, learner autonomy, peer-to-peer support, learner-centred approaches, communities of learners, knowledge building communities, community of practitioners, from input to outcome orientation, from welfare to neo-liberal/post-modern concepts of learner support, learner characteristics and serving special populations, understanding the target audience, assessing learner needs and appropriate services, gender mainstreaming in student support services.

Models of learner support: institutional aspects & approaches, organisational structures, centralised and decentralised models, regional study centres/virtual study centres, large scale/small scale approaches, business of learner support, cost-effective solutions, scalability of online tutoring, low-cost/high-outcome approaches.

Teachers & staff and learner support: tutoring, peer-tutoring, e-mentoring, moderating, facilitating, counselling, advising, guiding, coaching, non-academic support services (career counselling, study skills assistance, library services etc.), administrative support services (admissions, registration, student information systems, technical support), staff development, supporting teachers, models & best practices.

Study materials and learner support: supporting the learner through content and course design, creating learner-centred study materials, development of independent learning skills, assessment strategies.

Learner support for workplace training: supporting the employees as learners, using incentive procedures for increasing motivation, creating a learning organisation, supervisors as coaches, just-in-time training, learning-management systems as learner support.

Ensuring quality in learner support: evaluation, measures of success, efficiency, retention, student satisfaction.

The reader will now find papers assembled around workshop titles, which are not identical with the described topic areas. Readers are asked to access the texts via the workshop themes and titles of papers. Participants of the Third EDEN Research Workshop gain comfortable access to the papers through a password-protected database with full-text search function. The tight schedule between the submission of the final papers and printing of these Proceedings did not allow providing an index for avid readers.

We are grateful to all the authors who contributed to this undertaking and thus lay the ground for a promising Third EDEN Research Workshop. Franziska Vondrlík and Anna Wagner deserve our special appreciation for their support in the publication of this book.

Ulrich Bernath
Director, Centre for Distance Education
Carl von Ossietzky University of Oldenburg

András Szücs
Secretary General, EDEN

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Dietmar Albrecht, Volkswagen AutoUni
Hans Beelen, Carl von Ossietzky University of Oldenburg
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Jane E. Brindley, The University of Windsor & Carl von Ossietzky University of Oldenburg
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Joergen Grubbe, Danish Association for Flexible Learning
Börje Holmberg, University of Lund & FernUniversität in Hagen
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Ross H. Paul, The University of Windsor
Hilary Perraton, The Commonwealth of Learning
Greville Rumble, The Open University United Kingdom
Albert Sangra Morer, Universitat Oberta de Catalunya
Karen Swan, Kent State University
András Szücs, Secretary General, EDEN
Alan Tait, The Open University United Kingdom, EDEN Network of Academics and Professionals
Erwin Wagner, University of Hildesheim

Programme Structure of the Third EDEN Research Workshop 2004

Thursday, March 4, 2004

11.00 - 13.30	Registration and a light lunch in the Lecture Hall (Carl von Ossietzky University Oldenburg, Hörsaalzentrum, Uhlhornweg)				
13.30 - 15.30	Opening Session Keynote Speaker: Otto Peters on "Visions about learner autonomy and knowledge building"				
15.30 - 16.00	Coffee and tea break				
16.00 - 18.00	Parallel Workshops				
	W1	W2	W3	W4	W5
18.30	Welcome Reception in the Lecture Hall (Carl von Ossietzky University, Hörsaalzentrum, Uhlhornweg)				

Friday, March 5, 2004

09.00 - 10.30	Plenary Session 1 Keynote Speakers: Nicholas Allen and Alan Tait on "Institutional models and concepts of student support services"				
10.30 - 11.00	Coffee and tea break				
11.00 - 12.30	Parallel Workshops				
	W6	W7	W8	W9	W10
12.30 - 14.00	Lunch Break				
14.00 - 15.30	Plenary Session 2 Keynote Speakers: Gilly Salmon on "New roles of teachers & tutors" and Elsebeth Korsgaard Soerensen on "Communities of learners"				
15.30 - 16.00	Coffee and Tea Break				
16.00 - 18.00	Parallel Workshops				
	W12	W13	W14	W15	W16
19.30	Conference Dinner Buffet in the Oldenburg Castle (Schlosssaal). Best Paper Award donated by the EWE Foundation				

Saturday, March 6, 2004

09.30 - 11.00	Parallel Workshops				
	W17	W18	W19	W15 (cont.)	W20
11.00 - 11.30	Coffee and Tea Break				
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15.30	Social event "The Oldenburger Kohl- and Pinkelfahrt"				

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PROVIDING A SUPPORTIVE LEARNING ENVIRONMENT IN FACE-TO-FACE AND ONLINE COURSES - ANY SIGNIFICANT DIFFERENCE?

Michael F. Beaudoin, University of New England

Abstract

The transition of classroom faculty to distance teaching utilizing various communication technologies has generated increased attention to variances in the styles and strategies employed for communication between students and teachers in diverse instructional settings. This presentation examines faculty perceptions of interaction (based on the author's findings from a previous study of fifty faculty), a review of pertinent literature, as well as his own reflections of his concurrent teaching experiences with face-to-face courses, and with fully online courses. Insights regarding pedagogical implications and suggestions for future research are shared.

Introduction

The introduction and proliferation of instructional technology into the academic milieu, particularly since the advent of the Internet and its capacity for asynchronous communication across time and space, is having a profound impact on how faculty teaches and students learn. New instructional tools have increased the options and strategies now available to both. Typically, faculty make the transition into distance teaching by incorporating selected technological features into their classroom courses.

It is also typical that faculty boldly moving into the distance teaching arena gravitate to online products, now widely available as pre-designed templates in which an entire syllabus can be "put-up." However, most moving into online teaching begin by simply exporting content in its existing format for use in the online environment with little awareness of design considerations. As they gradually become more adept at navigating features available to them, instructors become more experimental and discover methods for re-constituting content into new formats suitable for online use. They also gain more insight into methods for providing support to students at a distance.

Since most find these initial forays to be worthwhile experiments, many eventually become involved in occasionally teaching a course entirely at a distance, often teaching in both environments concurrently. These experiences with new forms of pedagogy derived from making the transition from the physical to the digital classroom are even providing the professoriate with new insights about how to teach more effectively in their traditional campus-based settings. The debate continues regarding whether or not distance teaching involves a different and perhaps unique repertoire of pedagogical techniques than does classroom-based instruction, or are effective instructional strategies

fundamentally the same in both settings. I now function in both of these settings, and thus it occurred to me to reflect on the similarities and differences I utilize in providing a supportive learning environment for students who interact with me in face-to-face courses and in fully online courses.

Pedagogical Considerations

Peters (2002) writes of the intuitive and coincidental aspects of learning at a distance, pointing out that face-to-face instruction is typified by a linear approach, wherein students follow a prescribed and progressive program of study via orderly lectures delivered in a pre-arranged sequence. Distance learning formats permit students to proceed at a pace appropriate to their needs and circumstances, and allow a certain degree of flexibility and autonomy compatible with their respective learning style(s) which, in the case of many distant learners, may be minimally dependent on the role of an instructor.

This self-directed approach, which typifies adult learning in most circumstances, is compatible with the instructional style which Holmberg has labeled as “guided didactic conversation,” which he views as the essential ingredient for distance teaching.

Sadly, and ironically, whether it is called teaching, mentoring, or tutoring, the instructional support role in distance education has historically been undervalued. It is especially undervalued in many traditional academic settings where research earns greater recognition and rewards. But it is even more noticeably so in distance education, as the perception persists that the instructor’s role is primarily one of grading or marking student work. Paradoxically, as the quality of materials developed for self-directed distance learning has improved and the independent nature of distance students has been emphasized, the allegation that faculty are somewhat superfluous has strengthened. Yet, anecdotal reports and studies from many programs continue to reinforce that premise that it is the human connection that consistently determines distant students’ satisfaction. As Helen Lentell (2003) declares, “It is the tutor who individualizes and mediates the mass produced product of distance education. It is only to the tutor that the distance education learner exists as an individual.” A study of distance students in South Africa (Corry and Lelliott 2003) is representative of most research on the impact of faculty; they found that accessibility of tutors, for their comments, interest and emotional support, was the most help. Other than library services, which were used by one third, less than 15% reported benefits from any of the other types of services set up for distant student.

Still, there are many who question just how critical the role of the instructor really is in a learning environment where computer-mediated activity exerts such a powerful presence that it immediately creates the context for all that ensues over a course's duration. However, a recent study (Thurmond et al 2002) suggests that what transpires over time in an online course environment contributes to students' satisfaction. In short, what happens as a course progresses has a greater impact than student characteristics at the start of the course. This has important implications for educators, as it indicates that good instructional practices in virtual classrooms truly are critical to the ultimate success of the course and the satisfaction of participants.

These findings suggest that online instructors must adopt a highly flexible teaching style to be responsive to their students’ needs and preferences. But in a related research study, Kanuka et al (2002) concluded that even experienced distance educators are often not especially flexible, despite the fact that these same instructors recognize that the technology available to them can accommodate greater flexibility. Ironically, though many skeptics see technology as a constraining element in the instructional process, it is, in reality, a liberating resource that actually allows the instructor the opportunity to introduce greater flexibility in both teaching and learning processes. As students demonstrate the ability to assume more responsibility for their own learning, the instructor can accordingly allow for greater autonomy, and this can be accomplished just as easily within an online setting as in a classroom.

Unfortunately, the “anytime-anyplace” connotation of asynchronous learning implies that the most effective distance teaching is loosely structured, with minimum involvement of faculty. But I remain convinced that it is critical that the very best teachers play a lead role in innovative pedagogical practices to advance distance education to the next stage of its development. Techniques for online teaching need to receive ongoing attention, not simply with the premise that instructional strategies must be student-centered and provide adequate opportunity for dialogue, but also for the broader purpose of creating new paradigms that enhance the teaching-learning process at a distance, and with the goal of contributing new knowledge to inform theory and guide practice.

Anderson and Garrison write of communities of inquiry (2002) characterized by cognitive presence: the extent to which participants are able to construct meaning; social presence: the ability of learners to project themselves into a community of inquiry; and teacher presence: the facilitation of the above dimensions of inquiry to achieve desired outcomes. Each of these elements is dependent on the pedagogical and support resources made available to participants, and within the expanding portfolio of distance education options available today, these resources vary considerably. This variation exists even within a single institution providing diverse and distinctly different distance education programs.

MacKenzie et al (1968), despite being written more than thirty years ago, offer recommendations regarding instructors' tasks in correspondence education that are surprisingly current, and seem to apply just as much to online courses as to so-called "on-ground" courses. Since then, a number of studies have specifically addressed various teaching methods utilized in online formats and have assessed their efficacy. Tu and McIsaac, writing on *Social Presence and Online Classes* (2002), report on their own research and that of others (Christophel (1990), Kelley and Gorham (1988), Rifkin (1992), Sallinen-Kuparinen (1992), Gunawardena (1995)). All indicate that instructors with higher social presence (e.g., posting timely responses, adopting an informal communication style, facilitating threaded discussions, building trust, encouraging minimally active participants) were viewed as more positive and effective. These instructional strategies all contribute to creating a social presence that becomes the vital element in influencing widespread and consistent interaction within an online community of learners, even in situations where the course content may not always be viewed favorably by all participants.

Much criticism of online study focuses on what is perceived to be the Internet's adverse effect on social involvement, psychological well-being and, ultimately, on retention and academic performance. This argument is strengthened if there is minimal evidence of academic support services, of relatively immediate access to faculty contact and feedback, and other features that, theoretically at least, generally exist in face-to-face settings. Thus, mentoring in an online learning environment requires a delicate balance between developing learner independence, and establishing a supportive context for learning through guidance, advocacy and reinforcement. In the absence of most of these conditions, the transactional distance between student and institution increases, to the overall detriment of both the process and outcome of the entire distance education experience, and is likely to be felt by both teacher and student. Massie's research (2000) indicates that those e-learning courses that garner the strongest interest from prospective learners are those that offer tutorial support. It seems that, regardless of instructional medium and learning styles, a delicate mix of technology and humans is essential to maintain connectivity.

This suggests that the lack of social presence in online courses, whether real or imagined, can contribute to lowered student interest and persistence. Stein and Glazer (2003) reported on a case study of doctoral level distance learners to determine how they maintained a high degree of persistence at a point in their studies when graduate students are typically quite isolated. The researchers found that persistence is enhanced when the mentor develops a meaningful, personal relationship with the adult learner. Specifically, three themes emerged from their analysis to indicate what elements were crucial to persistence among the learners: responsiveness to learner inquiries, reassurance to learners that they can complete the program, and respect for adult life situations. It is interesting to note that all of these mentor behaviors contributing to student persistence have actually nothing at all to do with course content, but rather relate to procedural aspects of the course.

Building online "learning communities" has certainly become a primary area of interest of late; indeed, this is perhaps one of the main issues in the literature dealing with topic of interaction. Swan (2002) and others stress the importance of interaction for the purpose of building learning communities in online courses, and note that voluntary dialogue beyond course requirements is critical to promoting community. She and her collaborators found that interaction, and the value placed on participation, were the factors most significantly related to student perceptions. Early communication by faculty with students to impress upon them the benefits of community is essential, lest participants develop the attitude that elective discourse is superfluous and even dysfunctional for purposes of completing course requirements. Researchers are now finding that as verbal immediacy behaviors increase, so too does social presence in online milieus and this, in turn, contributes to a supportive environment that enhances the teaching-learning process (Swan 2002). Indeed, the asynchronous nature of online discussion is a significant factor in the success of online courses because, unlike face-to-face discussion, it provides students an opportunity to reflect on their course mates' contributions, as well as reflect on their own ideas before writing and posting. This habit of reflection, coupled with active discussion, appears to encourage the projection of personalities into the course environment, further reinforcing social presence and a sense of 'immediacy.' (Swan 2003)

Despite the absence of the usual visual and contextual cues, online participants have the ability to establish social presence by projecting themselves into a textual environment, provided that faculty foster a constructivist and collaborative ethos into the course from the outset. Individuals acquire knowledge and understanding by constructing meaning from various stimuli. This process is further enhanced when individuals collaboratively construct common understanding and meaning through shared activities within an interactive context. (Stacey 2003). Stacey's research found that the collaborative group develops a consensus of knowledge through communicating different perspectives and ideas, receiving feedback from one another and faculty, and finally negotiating until a common understanding is reached. This socially constructed environment is essential for effective learning as it provides a supportive context and stimulus for thought and expression, and thus becomes a means by which the group contributes more to each learner's new understanding than they are likely to be able to do individually.

John Dewey's writing (1938) on interaction, though articulated long before the era of online interaction, offers us insights that are remarkably applicable to online environments. Dewey believed that effective educational experience requires two essential processes: interaction (unique to individual learners) and continuity of interaction (whereby each learning experience builds upon previous experience). Ironically, Dewey's goal of individualization and customization of learners' experiences was less possible during his own time than it is today with the attitudes and tools that encourage students' constructive participation in what and how they learn, both individually and collaboratively, across time and space.

While much has since been written on the topic of interaction in online learning environments, there is still relatively little attention given to the lack of interaction, and its consequences on the teaching-learning dynamic. If it is an accurate assessment that a primary role of the distance educator is to manage the interactive process (between student-teacher, student-student, student-content, student-medium, and in some instances, student-practice environment), then it may also be true that situational course management is most appropriate (i.e., adopting instructional styles that are compatible with students' current learning styles). This requires excellent diagnostic skills to discern, at any given point, where students may be on the continuum of online dialogue, from inactive to reactive, proactive, and interactive. And each learner's primary mode of acquiring information may evolve as a course progresses, presenting a further challenge to faculty attempting to accommodate varied styles.

Certainly, the compatibility of learning styles with course structure and format, as well as with instructor attitudes and approaches, influences and affects all that ensues. One study (Aragon, Johnson, Shaik 2002) indicates that online students exhibit a higher preference for abstract conceptualization (learning by thinking) compared to face-to-face students, while classroom students preferred active experimentation (learning by doing). Moore and Kearsley (1996) posit that introverted individuals are more predisposed to distance learning than are extrovert personality types. The sensitive distance instructor, wishing to accommodate this latter style, may create an environment that facilitates reflective, intuitive ways of knowing, but might do so just at the point in the course when the more introverted and invisible learners are finally becoming more comfortable and increasingly participatory.

In the distance educator's well intended effort to promote and facilitate interactive and collaborative online behavior, the environment that is created can unintentionally cause some students to feel a loss of independence. The privacy afforded by more autonomous means of studying at a distance might be preferred by those students who, because of various attributes, simply feel less comfortable in more public modes of cooperative study based on intense dialogue and group interaction. But, it can also be argued that students best acquire the skills needed to be autonomous learners by first becoming adept at collaborating with peers and interacting with all the learning resources available to them. Knowledge of self as a learner comes, in part, from engaging with others; through this process, one's strengths and weaknesses can be revealed and addressed, hopefully in a reasonably supportive learning environment. (Pennells) In short, paradoxical though it may seem, independent learning can be fostered via participation in a learning community. By committing oneself to shared purposes of an interactive learning group, the individual can experience intrinsic rewards that lead to greater confidence and competence to then proceed more autonomously with the next stage of learning.

This increased awareness of self also aids in arriving at a sense of identity as a learner. While, in the past, students typically self-identified on the basis of a region of origin, affiliation with an institution, student and/or program cohort, etc., the electronic environment now makes students more location free in terms of where learning opportunities emanate from. Now, one's home can also become one's campus and library, and the PC one's office, and the workplace is a setting for meaningful application of new knowledge and skills.

In summary, I believe much of the literature, at least the material I reviewed for this presentation, indicates that faculty are able to achieve their pedagogical goals equally well in both face-to-face and online venues. My research of fifty faculty making the transition from the classroom to cyberspace (2002) indicates almost universal satisfaction with their distance teaching experiences. Further, their perception of their distant learners is that they too are at least as satisfied with their distance courses as with their classroom counterparts. The impressive and extensive battery of online course features now available not only allow teachers to accomplish every instructional activity possible in the classroom, but in fact, to sometimes wish some of the means and methods they can now employ via online course platforms could be replicated in a classroom. Perceived differences in the dynamics that occur within each context may be more a function of teacher attributes and students attitudes than of the medium itself.

Personal Reflections

In 2000, I began mentoring an online graduate course for the first time and, in 2001, began teaching a classroom-based seminar after a quite lengthy absence from the classroom. So, in many respects, teaching in both of these environments was a relatively new experience. In the case of the former, I did benefit from helpful initial training, ongoing technical support and the opportunity to observe an online course before starting my own. I also inherited a syllabus which had already been "put-up" online, and I was able to make alterations as I proceeded. And, at that point, I had done a good deal of research on distance education pedagogy. With the classroom course, I relied on past teaching experiences to determine how best to proceed, and here also, had a predecessor's syllabus to use or modify as I wished.

Observations in two teaching situations

- Being familiar with the literature, being able to witness an online course in advance, receiving training in navigation of the online platform- all were valuable resources which helped minimize a certain degree of intimidation initially felt about entering the arena of cyberspace teaching; in retrospect, having been able to co-teach the first time with an experienced colleague would also have been especially valuable;
- For the first semester (and even now, some three years later) there is the feeling that at least half of the students know far more than I do about how to manipulate the technology, and how to solve technical conundrums;
- There is a tendency to adopt a somewhat more formal communication style in an online format than in the classroom; on the other hand, students favor a "colloquial" style, and appreciate humor exhibited by faculty;
- More than any other trait, students value a strong faculty "presence," as evidenced by frequent postings, especially in response to students' postings, in the online environment. Ironically, while students in online courses typically get faculty replies within 24-48 hours, they still tend to be more impatient than classroom students, who accept the fact that they usually have to wait a week until the next class meeting before receiving anything back from the teacher;
- Online students especially appreciate faculty sensitivity to students' busy schedules and occasional tardiness in meeting deadlines for postings; those who are less "visible" also appreciate a teacher's recognition that they may still be actively engaged in, and learning from, the course;

- Both classroom and online students' evaluations, of both the overall course and with me as the instructor, were generally positive, but the ratings from online students were higher every term than those of their face-to-face counterparts;
- Students in face-to-face interactions seem to expect to be "entertained" more than those in online settings. While distant learners know, and seem to accept, the parameters of the online environment, in-class students often become restless unless the content and format changes quite often, not only from one class to the next, but even within the same session. Note: this may be due, in part, to the fact that most of the classroom students are themselves elementary and secondary teachers who spend a good deal of their class time finding entertaining ways to keep their students' interest and attention;
- Online teaching duties are generally more demanding than those of a classroom-based course. Though informed that it would get easier and take less time with each semester, I have not found this to be the case;
- In a moment of extreme candor, I must state that, although I very much enjoy face-to-face teaching, especially with adult students in a seminar style setting, I prefer online mentoring more. Note: It may be that this is due, in part, to the fact that the online courses I mentor are related to the field of distance education and, like myself, students are extremely interested in the subject; this likely provides extra appeal for teaching in this particular milieu.

Further Research

There is already available a considerable amount of comparative research on similarities and differences between classroom and distance teaching, but much of this work addresses the subject from a student perspective, rather than from the teacher's point of view. Neuhauser ((2002), for example, examines the effectiveness of online and face-to-face instruction, but on the basis of students' learning styles. It is hoped that we will see increased evidence of studies that focus on instructional styles in both settings, as have been initiated recently (e.g., Beaudoin (2002), Kurtz and Sagee (2003) and Wolcott (1997, 1999)). There are still many intriguing issues to analyze: why do so many faculty who venture into distance teaching, and who seem to find it a rewarding and think their students do as well, nevertheless still wish they could have some face-to-face contact with students, even though this is taking place daily via digital communication? Why do many distant students, who are not required to spend time on campus, still choose to attend optional residency sessions? Is this because they too feel the need for face-to-face dialogue with faculty and peers for it to be considered a "legitimate" educational experience?

Conclusion

As the professoriate moves inexorably toward greater engagement with distance teaching roles, whether this occurs voluntarily or by institutional mandate, it is essential that not only they, but also those responsible for faculty training and support understand the implications of this phenomenon for teaching and learning in the new century. As millions of new students opt for learning in new formats that defy time and space constraints, institutional leaders and instructional personnel who are not able to respond appropriately and effectively to this new demand, by recognizing both the similarities and differences in how teaching and learning occurs in diverse contexts, will suddenly find that both their institutions and themselves will become vestigial players in a changing world.

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Author:

Michael Beaudoin, Adjunct Professor (UMUC)
and Professor of Education, University of New England
Biddeford, Maine
USA
mbeaudoin@une.edu

FROM CAMPUS TO WEB: THE TRANSITION OF CLASSROOM FACULTY TO ONLINE TEACHING

Gila Kurtz, Bar-Ilan University, Michael Beaudoin, University of New England
& Rachel Sagee, Bar-Ilan University

Introduction and Aim of Study

While online teaching has created opportunities to expand the education process beyond the traditional on-campus experience, it also creates new challenges especially concerning the design and delivery of higher education. Previous research indicates that several factors affect the success of the process of implementing web-based instruction at the university level. Many of these factors relate to faculty as an important group of stakeholders (Olcott & Wright, 1995; Ensminger, 2002) whose instructional role is affected by this change (Wolcott and Betts, 1999). Though faculty are pivotal to a successful implementation of new online courses and programs, they are relatively ignored in the research and writing (Beaudoin, 2003).

The purpose of this study is three-fold:

1. To study the transition and self-perception of a sample group of Israeli faculty currently integrating online teaching within campus-based teaching. The authors examine respondents' perceptions of their new role and its rewards, their students' and their colleagues' perceptions of online teaching and how their institutions influence this process.
2. To compare findings from Israeli faculty to North American faculty, based on a similar study by Beaudoin (2002). This comparative analysis is also intended to provide ideas and insights to distance education administrators who are responsible for the recruitment, training and support of faculty. So that they might offer effective leadership in the design and delivery of supportive learning and teaching environments for both online students and instructors.
3. To contribute to faculty related research by exploring their new and changing role as Online educators.

In promoting integration of information technologies (IT) into the Israeli higher education institutions, the Israeli Council for Higher Education has employed a top-down approach obtaining additional funds and other incentives for universities to integrate IT into their academic courses (Guri-Rosenblit, 2002). In October 1999 the Council published a call for proposals. Acknowledging the importance of faculty and students in the process, the call included the following statement: "...to enhance establishment of support centers for faculty volunteering to implement the new IT into their lectures/seminars and other activities on a stable and ongoing basis, as well as for students" (Council for Higher Education, 1999). Two out of the eight institutions who accepted the proposals, Bar-Ilan University (the third largest university in Israel) and Levinsky College (the largest teacher training college in Israel) are at the center of the current research. As in the majority of the proposals, Bar-Ilan University and Levinsky College eliminate only part of the face-to-face meetings in class, using IT as an add-on function, rather than as a substitute for the lecture or seminar encounters (Guri-Rosenblit, 2002). The implementation of courses that use a blended approach (i.e., online teaching with face-to-face meetings) is discussed further in the research when comparing the Israeli distance educators with the U.S. distance educators.

Method and Data Collection

Nineteen educators were asked to participate in a survey: ten from Levinsky College and nine from The School of Education at Bar-Ilan University. Both Levinsky College and Bar-Ilan University, are

campus-based institutions. We used an identical questionnaire that was taken from Beaudoin's research (2002). The instrument consisted of both closed and open-ended questions that requested information about the background of the faculty, their perceptions of their new role and its rewards, their students' and their colleagues' perceptions about online teaching, and how their institutions facilitated this process. The data collection was done from November to December 2002 using mail survey.

Limitations and Significance

The relatively small sample size obtained in this research study might be seen as compromising the significance of the data reported herein. However, viewed as a comparative case study, these findings and interpretations can be useful in detecting patterns of responses from two faculty cohorts typical of large numbers of instructional personnel worldwide who are making the transition and adjustment from classroom settings to distance teaching. There is also value in comparing data obtained from faculty who represent seven different institutions and two countries to determine if their respective organizational and cultural settings affect their experiences and opinions when involved in a similar phenomenon. Further, the perceptions reported here can be instructive to those who are responsible for the design and delivery of online programs, hopefully developing the leadership necessary to advance distance education theory and practice

Results and Discussion

Following is a summary and discussion of the findings, organized by theme. Each theme is discussed in the context of the literature that frames the authors' understanding of the transition to online teaching.

Faculty Profile

Most of the faculty (74%) had more than ten years of classroom experience, 21% reported 2-5 and one had 6-10 years of traditional teaching. Their online teaching experience is considerably less, with 74% having 1-5 years background, 21% with 6-10 years, and only one had more than 10 years of online teaching.

All the respondents teach concurrently in both environments. All faculty (except one) combine face-to-face meetings with online teaching; 42% integrate the face-to-face meetings to a *high to very high* extent and 26% to *low* and *medium* extents respectively. They find this combination helpful for a successful teaching-learning process.

Training for Teaching Online

Learning how to teach online is important for an effective instructional process (Johnson & DeSpain, 2001; Bennett & Bennett, 2002;). Conversely, Rockwell et. al (1999) found that training requirements were one of the obstacles for educators who wanted to teach via distance due to time requirements. One of the macro-level institutional approaches of implementing IT in a higher education institution (Council for Higher Education, 1999) is demonstrated in the finding that 12 of 19 faculty (63%) reported they had received some type of training for their new roles as online educators, as opposed to 37% who did not receive training, either in their institution or out of it. A few indicated that they got personal training (mainly orientation on the use of technology), and a few others participated in online courses for teachers.

Roles and Rewards of Teaching Online

The role of 'mentor' was selected most often (56%) from a list of five options; 28% chose 'facilitator'. 11% identified themselves as 'teacher' and only one chose the 'content expert' option. These results indicate that the Israeli faculty adjusted from the traditional, teacher-led content model to a lecture-free focus on the process of learning, which places the student in charge of the learning process. This change of role is viewed as essential for a successful implementation of online courses (Hillesheim, 1998).

When asked if they felt their students recognize the importance of their role and its contribution to their learning, two third said 'yes' and one third replied 'no'. These results imply that, though technology allows students to be independent in their learning process, they still view the faculty as an essential component.

Wolcott & Bett (1999) offer some useful data regarding the distinction between intrinsic and extrinsic motives and rewards that drive faculty to become involved in distance teaching. In analysis of over hundred articles Parker (2003) concludes that faculty generally teach in distance education programs for the same reasons (incentives) they teach traditional courses; for intrinsic rewards. In the current study, when asked about their level of satisfaction with their online teaching, as intrinsic benefits, a slight majority (59%) replied that they were about as equally satisfied with classroom teaching as they were with online teaching. 29% indicated they were more satisfied with their online teaching, and only 12% felt generally more satisfied with classroom teaching.

In response to the question regarding the most rewarding aspects of their online teaching, the Israeli faculty cited the positive impact on the self-directed learning of students, multiple interactions and intensive dialogue with students.

Another tangible reward associated with online teaching is compensation, which is viewed as an extrinsic incentive (Wolcott & Bett, 1999). When asked to compare their salaries for online teaching vs. classroom-based courses, 68% replied they receive about equal pay for both types of teaching, 26% indicated they are paid less for teaching online; and only one reported on compensation at a higher rate for online teaching.

Students, Colleagues, Institution & Self-Perception of the Online Teaching

The study sought information about what the faculty perceive to be the opinions and attitudes of their colleagues, institutions, and students toward online teaching. To a question about their colleagues' perception of online teaching, 35% of the respondents answered that most other faculty considered online teaching less important than classroom instruction; 30% responded that colleagues considered online teaching equal to classroom teaching; 29% perceived their colleagues to be largely indifferent to online teaching. Only one responded that colleagues considered online teaching more important than classroom teaching.

The survey asked respondents if they believed their respective academic department and/or institution recognized their impact as online educators on their students. This question examined the leadership factor as Ely (1999) defines it: *an active involvement including providing support and encouragement to faculty*. Additionally, Wolcott & Betts (1999) state: *Perhaps the most valued extrinsic rewards in academy are those awarded tenure and advancement in rank*. In this research, most of faculty (70%) feel they get some acknowledgment for their role from their organization, and 30% replied they did not get any sense of recognition.

When asked to characterize their online students' satisfaction with their online teaching, compared with evaluations from their classroom-based students, the majority (68%) felt there was a comparable level of satisfaction among both student cohorts; 21% felt that online students were generally more satisfied; 11% were of the opinion that their classroom students were more satisfied. Several believe that the convenience and flexibility of the online format was what appealed most to students. Some faculty identified faculty feedback as the feature students valued more. Another positive aspect cited was the quality of the curriculum. Online teaching is not, of course, immune to criticism from their students. Most of faculty felt that the aspect of online teaching their students considered to be most negative is the fact that students were "forced" to learn through the new online format. Lack of personal interaction with faculty, too much work and poor technical support were other negative aspects cited by them.

Faculty Recommendations for Improved Online Teaching

Finally, respondents were invited to recommend changes they felt would improve their current online teaching. The most frequently cited suggestions concerned the pedagogy-technology integration such as: improve online teaching by adding more computer conferencing, enhanced electronic systems and more adjustments of instructional materials to the online medium. These recommendations have some similarity to a study held at State University of West Georgia where instructors who taught online courses were asked to list their suggestions on how the university can assist faculty in delivering online courses (Kenzie, et. al.,2000).

Interestingly, some faculty asked for inclusion of synchronous contact via the web. This finding can be explained by the recognition that synchronous communication promotes motivation and group cohesion, as well as providing good feedback and assisting pacing (Mason, 1998).

Comparison of the Israeli and U.S. Faculty

In this section, we compare findings regarding Israeli faculty to North American faculty, based on a similar study by Beaudoin (2002). Beaudoin's research studied the transition and self-perception of a sample group of fifty faculty, teaching in distance education programs, all of whom have taught previously (or still are teaching) in traditional campus-based teaching. His study examined and analyzed how these educators have adapted and adjusted to their new teaching milieu, how affective they feel they are, what tools they utilize, how satisfying this different role is compared to their earlier instructional tasks, and what their perception of their students' satisfaction with them is and with courses delivered in a solely distance learning context. As indicated, both questionnaires utilized in the studies were almost identical (The Israeli version was a Hebrew translation of the English version).

When the authors undertook these parallel studies of two faculty cohorts engaged in distance education, their purpose was to compare findings with related studies of faculty as primary stakeholders in implementing distance teaching modalities, and also to determine if there were any significant differences in the experiences and perceptions between the American and Israeli teachers. While the researchers did not venture any hypotheses in this regard, it was assumed that findings would corroborate those of similar studies, but that some noteworthy differences between the two respondent groups might be detected.

The results of the American distance educators faculty were quite similar to the Israeli online educators, though the Israeli counterparts revealed more positive experiences and opinions. All educators spend more time teaching online (average of 9 hours per week for the American faculty for a three-credit course and 5.6 hours for the Israeli faculty, per week per two-credit course) than they do face-to-face, and have greater communication with their online students. The Israeli faculty have more classroom experience but slightly less online experience and less students per course. The American faculty is less satisfied with their distance teaching than their Israeli counterparts and they had a less favorable opinion of the achievability and quality of distance learning outcomes. Also, more of the Israeli faculty think they have greater communication with their online students. These results might be explained by the report that the Americans are paid less and that some of them use the 'traditional', not so interactive, correspondence distance learning methods – exchange of print-based instructional materials via regular mail and not online teaching as the Israeli faculty.

The American faculty view their colleagues' and their institution's opinion on online teaching less positively than do the Israeli faculty. Sixty percent (60%) of both faculty reported that their involvement in online teaching changed their opinion of it for the better. Also, both faculty had similar recommendations for improving online teaching, except for the inclusion of face-to-face contact by the American faculty. As previously cited, all Israeli faculty (except 1) combine face-to-face meetings with online teaching to some extent.

Implications of the findings

Although neither of the studies reported here attempted to control in any way for the fact that both respondent groups are educators, it is of some interest to speculate on how this particular characteristic may have impacted the data. It does seem to the authors, at least on an intuitive level, that because all respondents are pedagogues (i.e., they are not only involved in teaching, but also hold degrees in Education or related fields, and also are involved in teacher education), it has some influence on the results. They were found to be especially insightful, both personally and professionally, in reflecting on the phenomenon under investigation in this study. Hence, it is posited that these respondent groups, as both scholars and practitioners of pedagogy, are more likely than, for example, teachers of chemistry or literature, to appreciate and understand the transitional process they are involved in. This status has provided the investigators with more reliable data from which to glean more meaningful implications.

In fact, despite differing institutional circumstances, varied instructional formats and any cultural subtleties at play, what was found to be most significant is the remarkable similarity in responses between the Americans and Israelis to almost every set of questions we posed. For example, results were strikingly similar regarding training, challenges, self-perception of roles, rewards, opinions on achievability and quality of learning outcomes and positive changes in attitudes toward distance education.

Most differences in findings from the two studies appear to be largely a function of institutional variables (e.g., pay structure) and course delivery methods (e.g., presence or absence of face to face contact). But when viewed in the larger context representative of a worldwide professoriate undergoing fundamental change in its instructional role, how it relates to learners and how it perceives this transition, it can be concluded that the presumed demise of human mediation in the face of the advancing presence of instructional technology is somewhat exaggerated.

Once engaged in distance teaching activities, a strong majority of faculty, even those who receive only modest training compensation and recognition, find the experience satisfying, and believe their students recognize the critical contribution they continue to make to the teaching-learning relationship, regardless of how aggressively interactive technologies may have intervened into the process. However more elaborate the modes of computer-assisted communication may have become just since the 1990's, there are certain fundamental principles applicable to academic discourse at a distance that seem to prevail.

It is also striking to document the highly positive attitude toward distance education that is shared by the two respondent groups, as they become increasingly engaged in their new instructional roles. It would seem that, just as Thurmond et al found in a 2002 study, what transpires over time as a distance course progresses, has a greater impact on students' satisfaction than those participants' characteristics at the start of the course, so too does what ensues over a course's duration have a significant impact on faculty satisfaction, regardless of their disposition at the outset.

Conclusion

Studies such as the current one, documenting positive experiences and opinions of faculty now engaged in online and distance teaching (both Israeli and U.S. faculty), are encouraging, and suggest that familiarity with distance education may lessen a good deal of earlier animosity towards it.

In his forthcoming book (*Critical Issues in Distance Education Leadership*, 2004) Beaudoin states: *We are, in fact, seeing increasing numbers of faculty at so many institutions now moving into the cyberspace environment to undertake all, or at least part, of their teaching responsibilities. It is interesting to speculate about how the cumulative effect of this phenomenon might impact the overall level of 'best practices' in online teaching.*

Yet, the road is still long; many educators still teach face-to-face only, and staunchly oppose the idea of teaching at a distance. It is hoped that the results of this study can assist decision-makers at

universities in implementing online courses. The findings should also help faculty and administrators identify and address pedagogical issues related to the transition from on-campus delivery to online-teaching. Finally, these findings could help researchers refine and focus additional research questions related to the implementation and delivery of online courses, and the critical role played by faculty in this dynamic transition of teaching and learning.

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Authors:

Dr. Gila Kurtz, Adjunct Associate Professor (UMUC)
Bar-e-learn Center
Bar-Ilan University, Israel
kurtzg@mail.biu.ac.il

Prof. Michael F. Beaudoin, Adjunct Professor (UMUC)
University of New England
Portland, Maine, USA
mbeaudoin@mailbox.une.edu

Dr. Rachel Sagee
Bar-e-learn Center & School of Education
Bar-Ilan University, Israel
sagee@mail.biu.ac.il

LEARNER SUPPORT IN THE FORMASUP DEGREE: VARIETY AS A KEY FEATURE AND CLOSE COACHING TO DRIVE INNOVATION

Marianne Poumay, University of Liège

Introduction

In September 2002, the University of Liège launched a postgraduate degree (called FORM@SUP) in Higher Education Staff Development¹. This FORMASUP degree (Poumay, 2003a) is coordinated by LabSET, support Lab for Telematic Learning, a research unit of the University. The degree aims at helping enrolled colleagues develop their projects in one of the two following areas: PBL (Problem Based Learning) or ODL (Open and Distance Learning). The orientation dedicated to ODL design, production and delivery leads to the production of quality courses in local languages over the Internet, through a TECCC approach². This degree also acts as an incentive (due to formal accreditation) as well as recognition for the involvement of the faculty members and external trainers in the continuing improvement of their courses. “There is no doubt that the quality of their pedagogy is today of paramount importance for the universities” (Leclercq, 1998).

This paper will first present the FORMASUP curriculum, then will focus on the learner support in this program and its impact, before discussing future possibilities.

The FORMASUP curriculum



To be selected in FORMASUP, candidates have to submit a written application (mainly the description of the project, but also needs analysis, candidate's time available, constituted team, institutional support,...). After a first selection, they are invited to an interview.

In 2002, 11 ODL projects had been selected. 14 new ones have been selected in 2003. Those projects cover a wide content diversity, each course concerning a different domain. The professors involved come from different higher education institutions (including the university of Liège) and different countries (Belgium, France, UK and Lithuania).

60 ECTS are subdivided into 18 for the common core courses, 18 for oriented courses (ODL/PBL), 18 for the development of the personnel project (the participants' own course) and 6 dedicated to external

¹ This degree is organised by the LabSET under the responsibility of Dieudonné Leclercq and Marianne Poumay, creators of this curriculum coordinated by Chantal Dupont. For the “Themes” activity, tutors are (alphabetical order) François Georges, Anne Hougardy, Lydwine Lafontaine, Laurent Leduc, Thérèse Reggers and Dominique Verpoorten, helped by Marie-France Brundseaux, Catherine Delfosse, Cécile Dessart, Chantal Dupont, Béatrice Lecomte, Robert Peeters and Ingrid Verpoorten for the individual project coaching.

² Training Embedded Coached Course Construction, as detailed in Poumay 2003c

valorisations (readings, participations to conferences, round tables, contacts, visits, poster discussions, etc), as often proposed in adult learning. The whole curriculum (60 ECTS) requests a one year involvement of the faculty member.

Activities are organised, in which the professors themselves (target public of FORMASUP) are exposed to a variety of teaching and learning approaches: they create, explore, practice, experiment, imitate, receive and debate and meta-learn. Those 8 *events of learning* (Leclercq, 2003) can be seen as responding to Gagne & Briggs' (1974) *events of instruction*. This variety of learning approaches is qualitatively important for the program (Poumay, 2003b). It follows the "practice what we preach" principle, where the teaching/coaching staff really tries to diversify the learners representations of what could be.

Courses are organised partly at a distance. The WebCT platform facilities are exploited to make the professors familiar with (a) the usual communication tools (e-mail, bulletin board, calendar, portfolios, group spaces), (b) road maps and a detailed planning of the distance and face-to-face activities, (c) precise descriptions of the objectives and sequence of each activity, (d) multiple links to deepen pedagogical and technical resources, (e) practical grids and tools corresponding to the ODL design steps, (f) slides and videos presenting some theoretical points, testimonies and "best practice" examples, (g) formative tests allowing for feed-back loops and regulation of the course, etc.

Videoconference is also used, to have international partners participate as invited experts to some debates and case analyses or, most of the time, simply to allow for communication between our French and English speaking groups of participants. As our 6 Lithuanian participants will not be able to come to Belgium to share with their colleagues, the whole curriculum has to be organised at a distance.

The central role of learner support

Following Charlier & Perraya (2000), we define learner support as « all the functions, roles and tasks aiming at guiding, helping and supporting the learners engaged in a training system partly or totally at a distance in achieving all the individual or collaborative activities. Tutoring concerns the learning aspects, but also the technological, relational and meta-cognitive aspects. »

As an introduction, Brindley & al (2003, 138) mention Salmon (2002, 1) who clearly indicates the necessity of tutoring and its importance in distance learning: "Successful and productive online teaching is a key feature of positive, scalable and affordable e-learning project and processes. Regardless of the sophistication of the technology, online learners do not wish to do without their human supporters."

More than just answering the students' expectations, tutoring also improves the quality of the learning process. For Fox (2003, 250), « A moderate level of CMC participation substantially improves the overall quality of the DE learning experience.»

Learner support in FORMASUP

In FORMASUP, the learner support is very demanding, just like in all those environments considered "interactive" as described by Mary Thorpe (2002, 107): "Courses at this end of the spectrum will have been designed from the beginning in order to take advantage of the interactive potential of online learning. (...) tutors must of course be content experts, but they will also need even more skills of learning facilitation than the conventional tutor (...) There may be some course materials prepared in advance, but (...) It is the purpose of the online interaction to use the learners themselves as a resource, and to build on their experience, reading and perspectives."

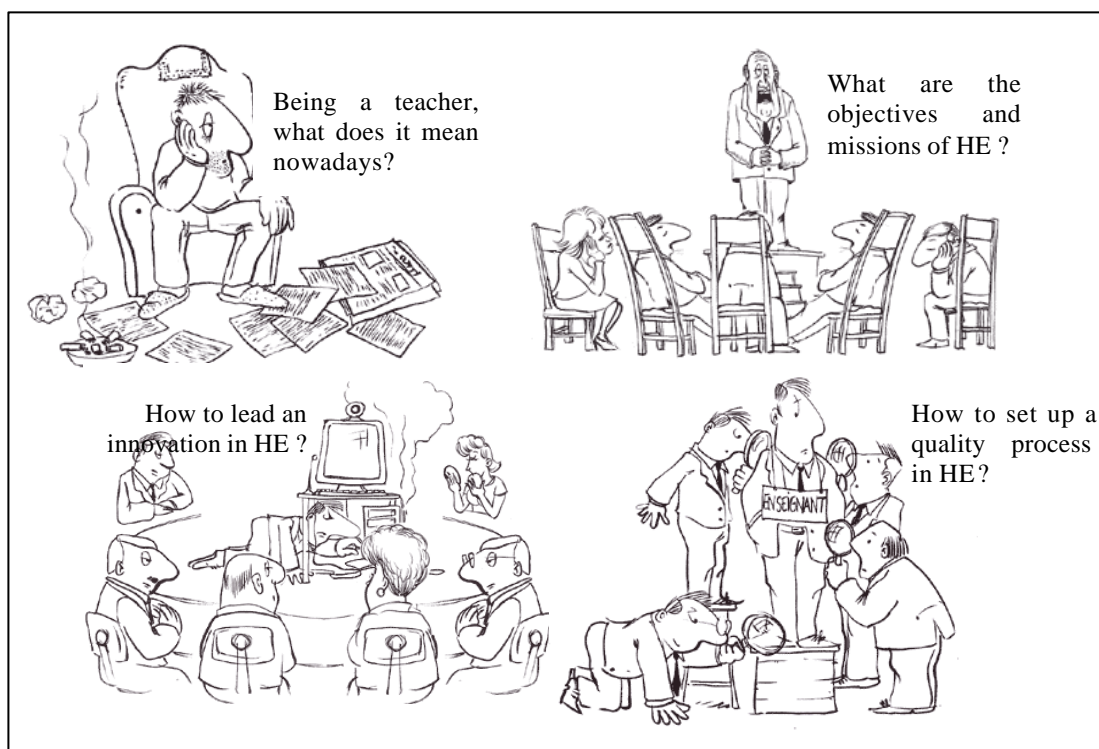
To facilitate contacts between the participants, but also between participants and coaches (at least at the beginning), a section of the Website allow for a description of each one, with photos, texts and links. Peters (2003, 67) notes that « All participants think that photos and biographies are a general enrichment of any distance education course ». Peters explains the reasons for the interest of such

presentation in the upper mentioned Master of Distance Education. However, FORMASUP organises frequent visual contacts (face-to-face or videoconference) with its participants, what lowers the mid- and long term interest of those presentations. They can still play an important role at the beginning of the year in facilitating first contacts, accelerating group building and establishing a personal relationship between the participants and their tutors/coaches.

Each participant is in close contact with two or three LabSET staff members. We really consider this close project coaching as one of the key success factors of this combination of training and course development. To allow for a better understanding of the central role of human tutors or coaches in FORMASUP, we describe hereafter the role they play in two of the main activities of the curriculum. We also characterise the differences between the two tutoring approaches.

Two contrasted types of learner support in FORMASUP

- In the core common activity, which mainly consists in a collaborative study of one theme chosen out of four, one tutor is responsible for the animation of each theme. The tutor posts introductory messages, guides the sub-group in making first reading choices in the proposed literature, agrees deadlines with the sub-group for intermediate productions, discusses arguments, etc. Each group of 3 individuals studies one theme, presented as a practical case (Hohl & Kanouté, 1999), two themes being studied in English due to the participation of Lithuanian colleagues. The cases comprise a title, a humoristic drawing (see below), a few paragraphs to set the scene and a selected and commented bibliography (minimum 40 commented documents in French or English). After 4 months, face-to-face (or videoconferencing for the Lithuanian groups) presentations will give the sub-groups the opportunity to present their work to the whole group. Comments and feedbacks from the other sub-groups allow for improvements before the submission of the final reports. Of course, all participants have access to all the discussion areas, but they are so deeply involved in one of them that they usually dedicate less time in exploring and commenting others' work. For most participants, the oral presentations represent a unique opportunity to discover unexplored fields.



4 themes to be collaboratively explored in FORMASUP

- In the close coaching of the individual project of each participant, the project being the online course this participant will design, develop and experiment during the program. This coaching is structured by common tools and steps that each coach proposes to his/her participants.

Coaching is either face-to-face for those who can travel to Liège or through other synchronous facilities (telephone, videoconference) for those coming from France, UK or Lithuania. It also takes place asynchronously, as an enormous amount of emails is necessary to keep close contact. From the first year's experience, we can estimate this individual project coaching to about half a day per week and per project, which represents a heavy workload for both coaches and participants.

A blended approach

We went for a combination of face-to-face and distance as well as for a mixing of different groups of students. Those two options seem to present some advantages, that should be further explored:

- We didn't notice any "invisible students" (Beaudouin 2003, 122) or « witness learners », as Fritch (1997) names them as they had learned from witnessing the interactions among the active participants. We analyse this situation as simply due to the fact that in FORMASUP, a close face-to-face coaching runs parallel to the on-line activities. A participant can be "invisible" in the forums, but be very active in the other forms of coaching and ask direct questions to his/her coach during face-to-face meetings to compensate.
- Our participants so far consider the groups mixing as an added value to their curriculum and an opportunity for them to be aware of others' institutional contexts, cultures and behaviours. This should be checked at the end of the program, as really working together might bring about some difficulties that the participants can't foresee at the beginning of the program. Their attitude is open and curious, we'll ask them at the end of the year whether they consider this cross-cultural experience as being an enrichment, as mentioned by Brian F. Fox, MDE3 student, who underlines the interest of "exposing me to the broad assortment of perspectives and experiences shared by my classmates" (Fox 2003, 247).

As a consequence, our tutors have to adapt to different situations (online versus face to face), different roles (see upper, in the two described activities), different groups (individual versus collective activities) and different cultures (Belgian participants, of course, but also French, English and Lithuanians). They have to be flexible and show their ability to deal with this diversity of roles, people and situations.

Tutor as tutored

One of the characteristic of our FORMASUP program is its aim of developing quality courses on the Internet through the individual projects of the participants (professors or assistants in charge). All the activities they live with us during a year in FORMASUP will serve as a basis for analyse, critics and advice. The role of the tutors/coaches both in the collaborative activity and in their individual project will feed the reflection on the role THEY want to play with their own students in the online course they develop. It is then of paramount importance that a deep meta-cognitive process takes place when they live tutoring situations they might want to reproduce or, at the opposite, when the encounter difficulties they would fear in their professional future. Affective components rise during the close coaching, allowing the participants to discuss those issues with their coach.

Experiencing varied tutoring modes is important for the FORMASUP participants, as they might want to "teach as taught", reproducing in their own distance course some features that might not be desirable if not properly analysed.

Impact and adaptations

For a continuous adaptation, we need to gather data and analyse both the satisfaction of the participants and the impact of the curriculum. In addition to the recorded interviews as a way to collect data for adapting the curriculum and the learning environment from year to year, we also gather the participants' reflexive analysis (3 per year), their advices after each significant step, their intermediate productions and several descriptors of their projects (the developed courses). Indeed, the quality of

³ Master of Distance Education, jointly offered and organised by the University of Oldenburg and UMUC Maryland (see <http://info.umuc.edu/mde/>)

their productions is one of the indicators to approach the quality of our own offer. A longitudinal follow-up is also running, to take into account the sustainability of the noticed changes.

Measuring the impact of the curriculum is not an easy task. In 2002, we analysed 13 of the courses developed by our participants. We isolated the activities proposed in those 13 courses⁴ (about 50 activities) and classified each of them following the pedagogical model of the 8 *learning events* (see upper). Our analysis clearly showed that the developed on-line courses were rich and varied in terms of *learning events*: on the 13 courses, we noticed a mean exploitation of 5 different *learning events* out of 8, some courses even exploiting them all. The decisions of exploiting one or another of those *events* depend upon the objective of the course, the available material, the professors' preferences and, last but not least, other constraints like the available time, the number of students concerned etc. The observed learning events in those 50 activities were quite well balanced between active (in a constructivist sense) and more passive ones. We also noticed some interesting features like the massive presence of the *debate* event, difficult to organise in conventional large auditoriums of more than 200 students, and the presence of the *creation* event, allowed by innovative methods involving peer-to-peer tutoring and groups crossing. Those analyses show an interesting variety in the developed activities, bringing a real added value to the former courses of those 13 professors.

Individual interviews tend to show that this variety was mostly due to the close individual coaching and the exchanges of practice organized by the teaching/coaching staff. Raising awareness on others' ideas and pedagogical strategies together with the analysis of those practices, both through the coaching and through presentations (critical demonstrations), was considered as a strong innovation factor. From such interviews⁵, Delfosse and al. (2003) have isolated 14 success factors. Whereas the majority of these success factors seem to be obvious, this analysis helps considering the relations between these factors as well as the way of managing them successfully. For example, we learned that learner-centred events and approaches were convincing for those professors, but ONLY after having seen and analysed several successful experiences (best practice examples) and having benefited from the support of an individual coach, able to connect theories and practices with the individual project of each participant.

Approaching the quality of the curriculum through some quality indicators in some of the products of this curriculum (in our example: the developed courses) only provides a partial view of the targeted quality, but crossing several indicators gives a complex picture that we find very useful in the continuing improvement of our curriculum. For example, the impact of the coach being considered as so crucial by our participants both for their own satisfaction and for the quality of their productions, we couldn't decrease the time spent in the close coaching of the individual projects. To balance that deep involvement, we imagined the group activity on the four themes (see upper), asking for a lighter involvement of human supporters. This collaborative activity also balances the more individual work on the project, giving the participants the opportunity to live different educational settings. On a staff point of view, preparing the learner-centred study material is also time consuming but can be done during the summer holidays, when the close coaching is almost finished. It remains possible for the same team to both continuously adapt the material for the collaborative activity and closely coach the individual projects.

This new curriculum is the result of an adaptation of the first year organization, thanks to our data gathering and analysis. We have the great chance of working with good willing participants, who really understand the value of those data... and hope their own students will accept to reflect upon their online experience as well.

Challenges and Perspectives

In Belgium, the critical mass of ODL courses is not yet reached, but is really in progress. Quality courses are developing, thanks to regional initiatives and university curricula. At the same time, we

⁴ A "course" is here corresponding to about 30 hours of student learning time. It comprises several learning activities adding value to the former conventional course.

⁵ Delfosse and al. have analysed the interviews of some FORMADIS and FORMASUP participants (professors) having developed with LabSET 20 different projects in 2002.

address the problem of staff development, impacting the quality of the course offer at the university and, consequently, trying to address the problem of the huge failure rate. FORMASUP is at the crossroad of those important challenges.

The staff development is not only a challenge at the university level; it is also a challenge for the LabSET team itself. The close coaching is very demanding. The team has to be able to apply knowledge, summon up theories and best practice examples, always ask why and how, anticipate problems and imagine creative solutions or simply ask for help when needed. Those new professionals are guiding our professors and fostering innovation in our institutions. Therefore, LabSET has organised an internal staff learning program with exchanges on different themes, production of integrative documents, witnesses of colleagues, critical analysis of documents, participation to conferences, etc. Amongst the results of the 12 internal three hours sessions held in 2003 (about once a month), we can underline the creation of a case data base where the LabSET staff members enter a series of descriptors for each individual project they have coached. The use of this data base and its facilitation of the coaching activities of the staff members will be observed in 2004, in parallel with its continuing supply with new cases. We strongly believe that the learner's support in FORMASUP is so complex that the coaching staff needs training and knowledge management tools to achieve it professionally.

We continuously analyse and discuss challenges to better face them. We also noticed that the participation in FORMASUP, even though considered as a real impulse to innovation, needs follow-up and the establishment of communities of practices in order for those changes to be sustained. Former participants come back to our conferences and regularly contact us, but we should have a closer look at the way they maintain their developed distance courses and, for example, the type of learner support they consider as the most successful in their respective environments.

Our future agenda will also have to better organise the international experience sharing, as several universities are now very efficient in online tutoring and have interesting ideas we could benefit from. LabSET will welcome collaborations on tutoring as well as on the TECCC approach that seems to be particularly suited to adult learning in Higher Education (Knowles, 1978).

And finally, we fully follow Mary Thorpe when she underlines that everything has not been said: "We can be assured that there will be no single model of online learner support. We can anticipate that a variety of roles and titles will continue to develop" (Thorpe, 2002, 114). There is space for research in this interesting field of tutoring !

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Author:

Marianne Poumay
University of Liège, LabSET
Bvd de Colonster, 2, B9, B-4000 Liège, Belgium
m.poumay@ulg.ac.be

IS OPEN AND DISTANCE LEARNING THE TAYLORISM OF THE TWENTY-FIRST CENTURY? THE CHANGING ROLE OF ACADEMICS IN OPEN AND DISTANCE LEARNING ENVIRONMENTS

Marylyn Whaymand, University of London

Is Distance Learning fast becoming the “Taylorism” of the twenty-first century?

Are Universities in the process of becoming degree ‘factories’? Such a claim carries with it some elements of sensationalism but it would be dangerous to dismiss it without serious consideration.

Taylorism

Frederick Winslow Taylor, born in 1856, created a system of factory production that became known as “Scientific Management”. He introduced the division of labour to minimise the amount of time and energy consumed by the production process. Instead of a single, skilled labourer producing the whole product, the production process was divided into a series of different tasks, each one given to a separate worker. This meant that unskilled workers could be used in almost all the labour processes and that production could be achieved without increasing workers’ hours. Taylor discovered that by exploiting the labourer’s labour power to its maximum, far more could be produced. He decided to increase the wages of those workers who were highly productive whilst ‘casualising’ the role of others.

With the advent of the assembly line and the division of labour, knowledge of production techniques passed from worker to management, as did the power such knowledge held. Management came to hold the monopoly over knowledge and workers became detached from their work - they were no longer required to understand what they were doing. Taylor created a factory working at a constant optimum speed – producing with great efficiency – but loss of quality. When a skilled craftsperson is turned into a labourer, the value that they see in the work they do is measured in the time taken to produce an object, not in the quality of what they have produced – this effectively turns a skilled worker into a clockwatcher.

Now the skilled worker was no longer irreplaceable – one worker was much the same as another. Segmentation of the time intervals during which productive activities could interleave and overlap were introduced - not requiring co-presence of expert artisans – expertise was embedded into the process itself and control of it placed in the hands of those managing the process, rather than the artisan/craftsperson.

The coming of “Scientific Management” brought about the end for the craftsperson as it did not require a worker to have a ‘real’ understanding of their work – all it required them to do was to follow management instructions exactly. Skilled workers experienced a lowering of status, a lowering of pay, and alienation from their task. This qualitative and quantitative shift in their experience is highlighted by the fact that all Taylor’s principles “had the specific purpose of increasing productivity”.

Distance Learning and Academic Roles – Division of Labour and Separation of Tasks

Considerable changes in the academic role have been brought about by the increasing use of ‘virtual’ and ‘managed’ online learning environments for the delivery of distance education. By contrast with a traditional “one lecturer – one course”, ‘tell-and-test’ method of course preparation and delivery, the context of distance learning shifts the focus away from teacher-centric towards learner-centric learning, and requires a variety of activities and roles being performed in specific ways at specific times. No one academic member of staff can perform all of those ‘roles’. Best practice, mixed mode, distance learning requires a managed team of individual specialists to generate and deliver a course module/degree programme.

This shift in tertiary-level educational practice is analogous to the early production of specialist motor cars compared to the manufacture of those produced for the masses:

The earliest Lotus motorcars were produced by a single, expert enthusiast carrying out all roles of production from design, procurement of materials, manufacture, to testing and marketing. The model T ford, however, was never produced in that way. It was a committee product, with different specialists - small cogs in a big machine - contributing different parts to the whole product, in a process controlled by managers of production.

Previously, every lecturer was an artisan who created their own courses – they are now the retailers or distributors of courses manufactured by a degree production team. With the availability of reusable learning objects, a course designer can build a course module by mixing and matching learning objects created elsewhere by others and made available for delivery by organisations like LTSN (Learning Technology Support Network - in the UK), OKI (the Open Knowledge Initiative), and by MIT (Massachusetts Institute of Technology - in the USA). These are learning materials that are presented on the web for anyone to use – (video lectures, powerpoint presentations, and readings) ready for the user to ‘pick and mix’ to fit their own syllabus.

The academic module deliverer is now not necessarily the module author, but may be responsible for maintaining and amending course material. The emerging module tutors for mixed mode, distance delivery, will be hired on the strength of their performance skills, not on the strength of their ability to produce high level research. In contrast, the research “five stars” of the UK University system will be hired on their research skills, and will teach less and less. This is the amplification of a process begun at the Department of Computer Science, QMUL over five years ago.

The module tutor will now have to be much more aware of the diversity of the student population. Traditional 18-21 year old students have very little expectation of University education, other than a continuation of what they experienced at school. They rarely question why they have to learn material given to them by their academic instructors, providing a traditional “tell and test” mode of delivery. A diversified student population, however, composed of mature part-timers, company managers, people with 30 years work experience, have a culture of learning that is very different from the school leaver. The academic tutor is now in a position where they will have to develop a repertoire that ‘sells’ the module, in that they must create the incentive for these 21st century students to learn – and they have to create multiple incentives as the market is so diverse. Tutors will also have to be aware of cost of their product, so that their courses are competitive in the open market. Lecturers have to give thought to acquiring skills in presentation and ‘marketing’ which previously they would not have had to consider.

This qualitative and quantitative shift in the lecturing role is analogous to a major shift (in the UK) that has taken place in staff training and workforce skilling since the 1970s, with the collapse of the “apprenticeship” schemes in manufacturing and other ‘productive’ (as opposed to ‘service’) industries. Large companies shifted training away from expert, shop floor mentors and craftspersons to specialist “trainers” who did not need to be experts in the training they gave – rather they were qualified Human Resource/Professional Development trainers.

If creativity and expertise in subject content are taken away from the teaching lecturer, where else can they excel? Where else can there be a difference in the margin between a good and bad course provider? It can only be in performance – the presentation and delivery of the course. For the University lecturer, what was previously connected, is now in the process of being split apart.

Dispersal of Academic Expertise and Lowering of Academic Status

With the advent of e-learning and management of e-learning systems for knowledge transfer, academic expertise in the creation and delivery of degree level courses is dispersed and the position and status of lecturing staff are devalued. The traditional role of the university lecturer is split with the separation of the content creation process from that of delivery. The content author is alienated from delivering their material while the course tutor is alienated from researching and development of their subject, resulting in a loss of specialist knowledge, a loss of ‘real’ understanding, and also possibly, a loss of motivation..... Without a research background in their repertoire, it is difficult for the course

tutor to maintain high quality course material necessary for the continual improvement of teaching. It is the research active academic, performing one of the roles of course author, who will be required to provide high quality material for maintenance of the course module.

In this model, it is easy to make an association with those “unskilled” workers employed in the scientifically-managed, factory system of the early 20th century; assembly line education requiring the efficiency of the division of labour, resulting in the passing of knowledge of production techniques from the skilled worker to management; and with it, the power and status that such knowledge holds. The teaching specific academic will not be required to have a deep understanding of what they are doing; the skilled academic of former times is no longer irreplaceable; non-research active, academic teaching staff will experience a lowering of status, a lowering of pay, an increase in ‘timetabled’ vs non-timetabled work, and alienation from their task. The separation of academic teaching from academic research also drives a wedge between the measures used to reward performance. Research is measured by “outputs” (publications, funded projects) which the research academic has control of, whereas teaching is measured by extrinsic measures (eg contact hours, pass rates), outside of the tutor’s control.

Transition from Traditional Academic to Tutor of Mixed Mode, Distance Learning Modules

The transition from the role of the traditional, teaching and research active, university lecturer, to that of tutor of a ‘mixed mode’, distance learning module, is a difficult transition to make. The tutor has to adapt to changes in the method of course delivery; they have to learn to work well in team contexts for development of course modules; they are required to produce exercises and activities that are student-centred – and which facilitate problem-based learning, discovery learning, and reflective practice devolved to the learner. Instead of standing at the front of a lecture hall and presenting their lecture, they will facilitate the transfer of information, learning and communication, online. Instead of working on one course, they will work on parts of different courses – with bits of one course plugging into another – possibly for delivery at another university. They will not write all of the course material; they will not necessarily be the teacher or the evaluator/assessor of learning. Their roles, therefore, have been segmented and fewer are under their direct control.

Many lecturing staff at traditional UK universities will not make this transition with ease.

Module authors will have to develop and write course material for presentation online, rather than working from notes or what is in their heads. They will have to learn to take instructions from online learning experts skilled in module development, and fashion their materials appropriately. Inevitably, whatever their enthusiasm for new teaching modes, they will tend to resist such apparent regulation of their flexibility.

Module teachers will need to shift the focus from themselves as teachers, and concentrate on how the student learns to learn. There is also the difficulty, as degrees become more vocationally focussed, of familiarising themselves with employers’ skills requirements and expectations of learning – an area which in the past has been something of an anathema to academic staff at UK universities.

When the module is delivered, tutors will have to share the teaching experience with other team members: the course mentor, and senior administrative staff, employed to ensure that the teams are adhering to “operational” guidelines.

All of these experiences will, for most academic staff from traditional universities, enforce a steep learning curve, and, for some perhaps, enforce a pathway that they feel ill equipped and/or are unwilling to tread. In addition, the acquisition of pedagogic skills has been under-valued in traditional UK universities. In the past, academic staff have not been required to take courses in teacher training – the prevalent assumption being that research-active staff acquire teaching skills through “osmosis” from senior academics. Whatever the traditional position, universities are now faced with the huge responsibility of provision of high-quality training programmes for course authors and course teaching staff about to be engaged in the development and delivery of mixed mode, distance learning programmes. In an effort to accommodate the increased pedagogic demands of widening participation and diversification of degree delivery requirements, there has been some recognition, in recent times,

of professional development needs for academics, with the advent of teaching accreditation, TQA, PGCAP; and the relatively late introduction of national initiatives like ILT, HE Academy, LTSN.

In modern environments for provision of distance education at degree level, it is apparent that these roles cannot be carried out by academic staff acting alone. The skills and competencies required are simply unachievable by staff whose other duties require high profile, academic research combined with administration. An alternative model, however, has to locate these divisions of responsibility amongst staff involved in delivery of distance learning in ways which permit both efficient use of expensive staff resources, excellence in pedagogic practice and student support, and a structured career pathway for those engaged in those separate responsibilities.

This paper presents a model of change in academic practice which endeavours to ensure effective pedagogy for distance learners. It takes as its example, the delivery of distance learning modules to populations of workplace and home-based students, undertaking first-degree level studies, with infrequent, face-to-face tutor contact.

Beyond the benefits to distance learners of changes in academic tutor roles, there remains the question of how to make this an attractive model for the academic provider.

Adaptation of Academic Tutor Roles for the Delivery of Open and Distance Learning, Modular Degrees to Part-Time, Mature Students

With the shift from the craft to the industrial model of academic activity, we have the advent of Taylorism in Higher Education. Managers now negotiate with academics regarding how much time is spent on each of the distance learning roles. With the introduction of widening participation, the further increases in numbers of students at UK universities, and the introduction of mixed mode distance education provision, we have the sub-division of academic roles amongst a variety of specialist staff. Universities are able to produce degree programmes to the masses with greater efficiency, but the dangers, of course, are a lowering of higher educational standards, the lowering of academic tutor status, and the lowering of value of a degree qualification.

In the mixed mode, distance learning model currently employed at the ODL Unit, Queen Mary, the academic tutor roles are separated in the following ways:

The Academic as Instructional Designer:

The instructional designer role is performed by academics and module development teams. The content of a course module is most likely to be derived from the work of a research active academic staff member while the syllabus, learning objectives and forms of assessment are negotiated with the module development team. The learning objectives and forms of assessment are properly integrated into subject curricula, so that the requirements of academic input match the diverse modes of delivery and different learner populations taking the course module. The team has to ensure that assessment is both fair and discriminatory in relation to student performance; that achievement by students is suitably rewarded; that conceptual, technical and practical difficulties in fulfilling aims and objectives are circumvented in the delivery of learning modules, and that synchronous and asynchronous interaction between students and teaching staff compensates adequately for lack of face-to-face contact.

Instructional design now has to accommodate the constraints of distance and diversity in ways that the traditional “chalk and talk” methodology never did – eg our practice at the ODL Unit, QMUL, is to separate development of course modules from that of delivery, so that the original academic author perhaps delivers the module only once and, thereafter, it is managed and run by teaching specific staff (the content provider only being required when learning material and forms of assessment need to be updated and validated).

Module development team members refine the structure of course content provided by the research active academic so that it meets online design parameters; they refine activities and exercises; collate and check deliverables; mount prepared coursework. They also implement, test, and evaluate the module on selected mentors acting as module ‘guinea pigs’. They ensure that learning objects conform

to IMS standards (Instructional Management Systems) and supply the evaluation data required for university level QA processes. To summarise: design, implementation and delivery are now separated into different roles; the academic specifies what, the implementers determine how, and the operational managers determine when.

The Academic as Tutor:

The tutoring role is performed by teaching staff but not in isolation. The success of the ODL teaching model is heavily reliant upon the support and cooperation of a variety of other staff members. Teaching assistants support the module tutor by covering the day-to-day monitoring of student discussion forums, and replying to student academic/technical queries. They are responsible for prompting students to draft responses to activity / discussion tasks and to post them online to mentors, via the discussion forums; they carry out the ‘first marking’ of coursework assignments, and share with the module tutor, responsibility for running several sessions for online questions/answers – tutorial-like sessions using ODL conferencing software set during critical points in the run of a module.

The module tutor, instead of the traditional “hands on” role of the university lecturer, acts more as a manager coordinating specific tasks during the module run. They have a student management role in that they monitor low student online activity, and co-ordinate with mentor support over student problems; they are required to check the digest of mentor reports identifying student activity and problems, and if corrective action is needed, they advise mentor support, identifying problem students / issues and action to be taken; they prepare and check coursework assignments before release on the VLE; they issue schedules of deliverable requirements to teaching assistants and the mentor support team; they allocate first pass marking of coursework submissions and marking schema to TAs and are responsible for producing coursework assessment descriptors; they check consistency of marks awarded, second check coursework marks, and then collate them.

Each course tutor provides a Lesson Plan giving details of topics and activities to be covered during the run of the module. This forms a week-by-week breakdown of classroom sessions referring to the online syllabus. The module tutor checks that coursework assignment guidelines are clear, and that the schedule of coursework deliverables does not clash with statutory holidays. The tutor is also responsible for providing Student Attendance Reports and Learning Development Proformas.

The latter ensures that the syllabus is covered; that the students’ online work matches with that described in the Lesson Plan; and that any problems the students may have had are identified.

The tutor makes recommendations to the module development team for improvements to module content, with a suggested deadline date. In addition, tutors and/or teaching assistant(s) run four, one-hour, online question/answer sessions which are set at critical points during the delivery of the module.

The Academic as Examiner:

The emerging practice of requiring tutors to take responsibility only for summative assessment, while formative assessment is to a greater extent devolved to peer review, self- evaluation and the inputs of mentors (monitoring/providing feedback) is yet another example of the advent of Taylorism in Higher Education.

Formative assessment not only provides feedback on performance to learners, it also provides guidance to the teacher as to how they might need to modify their lesson plans for the remainder of the module in order to accommodate any necessary adjustment to meet learner needs. Although assigned work is designed by academic staff who may not be heavily involved in teaching, its administration and some of its evaluation, is devolved to teaching-specific staff as those roles require pedagogic rather than subject-specific skills.

Summative assessment now has to meet external, professional development criteria. This requires the module examiner to take into consideration: skills mapping, learning outcomes, and the mapping of academic targets to professional requirements. It leads to quantitative performance measures which require finer-grained metrics of learner performance than traditional “final examinations”. It is not always the case that traditional academic staff are most able to map academic performance measures

to professionally accredited requirements, and even when competent, many traditional academic staff find the task contrary to their academic goals for a course.

The Academic as Manager:

The academic as manager is one amongst a team of managers deciding what is being delivered, how it is being delivered, and when it is being delivered - eg repetitions of mixed mode, distance learning delivery may be decided by an Operations Manager, in consultation with a Technical Manager, and the academic as Module Manager.

The diversity of delivery methods and separation of roles places greater demands on the module provider (when they are both part of the module development process and also module tutor) to engage with development and delivery teams, so that class management at a distance is effective, and student support matches the requirements of the variety of target populations as far as is possible.

The Academic as Mentor:

Pastoral and advisory roles of academic staff have been diminishing in traditional universities owing to the massive increase in student numbers. In ODL programmes, we have separated out this role entirely, employing hourly paid, part-time mentors, to fulfill that aspect of the traditional lecturer's work.

Evaluation and Conclusion

The ODL programme at QMUL - a traditional college of the University of London, one of the big four colleges of the largest university in the UK - exists to try to satisfy two apparently contradictory objectives:

1. To widen access to populations of students who would otherwise be unable to achieve degree level education.
2. To maintain the high quality and academic status of University of London degrees wherever in the world they are delivered.

These objectives conflict in so far as the traditional prestige of University of London degrees has rested upon the high calibre input of internationally renowned, research active, academic staff; yet as argued in this paper, such academics are, on the whole, neither prepared nor able to meet the needs of widely diverse, remote learners, in distance education contexts.

In separating out the differing roles of staff in preparation and delivery of learning opportunities to these diverse student populations, it is always a question of balancing between the competing objectives mentioned above. How well this balance can be achieved for a traditional university such as QMUL, may only be assessed in terms of the following material:

1. retention and progression of distance learners by comparison with traditional on campus students.
2. benefits to academic staff participating in development and delivery of distance learning modules.
3. reduction in cost to the university per capita.
4. comparison with gender, ethnicity, social and economic profiles of distance learning intakes, with traditional intakes to QMUL degree programmes.

This paper is not, however, the place to present this evaluative data.

In the above, I have explained the meaning of the process of Taylorisation and its relevance to the transition of the traditional academic role; I have demonstrated how that role has been sub-divided into a variety of differing specialist roles to accommodate the delivery of mixed mode, distance learning degree programmes; I have shown how academic expertise in the creation and delivery of degree level courses is being dispersed, and the position and status of lecturing staff devalued with the advent of e-learning and management of e-learning methodologies for knowledge transfer; I have explained how difficult the transition from the role of the traditional teaching and research active, university lecturer, to that of tutor 'of a mixed mode, distance learning module, is to make. I have also explained how the mixed mode, distance learning model currently employed at the ODL Unit, Queen Mary, separates out academic tutor roles.

Explanation of Terms

1. *Online Learning* is a generic term that can include Distance Learning, Blended Learning, and Online Instruction. It is mostly asynchronous; is not necessarily remote; and can be instructor or student-centred.
2. *Blended Learning* is a mixed methodology of traditional, face-to-face lab/classroom sessions, and distance learning sessions where material is made available to a student via a VLE. The face-to-face sessions are obviously co-present, mostly synchronous and can be either student-centred or instructor-led. The distance learning sessions are remote and mostly asynchronous.
3. *Distance Learning (interspersed with residential components)* is a mixed methodology of distance learning (see blended learning) and some intermittent residential components where face-to-face teaching sessions take place. The residential components are co-present, mostly synchronous and can be either student-centred or instructor-led.
4. *Synchronous Learning* (CSCL Computer Supported Collaborative Learning) mainly student-student interaction; *Synchronous Instruction* (CSCI) mainly a 'simulation' or replication of classroom contexts online (whiteboard, video, document projection).
5. *Distance Learning* is remote, mostly asynchronous and student-centred (ie learner managed and not instructor led). It does not have to take place online (eg distribution of work books and cds).
6. *Module* is a course unit, delivered online.

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Author:

Marylyn Whaymand
Programme Manager
ODL Unit
Queen Mary, University of London
Mile End Road
London E1 4NS
marylyn@odl.qmul.ac.uk

COMBINING STATISTICAL, QUALITATIVE AND EVALUATIVE RESEARCH TO DEVELOP A REGIONAL RECRUITMENT AND RETENTION STRATEGY IN LINE WITH INSTITUTIONAL MISSION

Judith Fage, The Open University in London

This paper describes the way in which a regional recruitment and retention strategy can be informed by research at different levels, through combining information from statistical, qualitative and evaluative studies. The case study is the development of a strategy following the move of location of the Open University's London Regional Centre from a suburban area of London (West Hampstead) to a more central location (Camden Town). The decision to move to this area was based on a wish to be located within an area of diversity, in terms of age, income and ethnicity, in line with the mission of the OU UK to reach out to all parts of the community; though our remit is to the whole Greater London area. In addition, Camden Town is extremely well served by public transport, in the form of both underground and overground trains, and buses.

Once settled in Camden Town, our task was to find ways of optimising our presence and also of developing a recruitment and retention strategy, within a context, common to all HE institutions in the UK, of a growing need for cost-effectiveness within constrained resources. We had become immediately aware of the impact of an accessible Centre with a large and welcoming reception area, with materials and PCs with access to our Internet sites. 'Drop-ins' – unheralded visits from students and prospective students – immediately doubled in number and have been steadily increasing over the past year. This was particularly interesting to us in the context of an ever increasing level of E-learning in the University, and a huge growth in the number of students and enquirers using the Open University's Learners Guide on the Web (www.open.ac.uk/learners-guide) to obtain guidance, select a course of study (www.open.ac.uk/courses), and register for it; and confirmed our experience that prospective students still like to talk to an adviser personally if this option is made available. We had to make plans to deal with this, through a year-round series of Open Wednesdays and Saturdays; visitors at other times, though seen if possible, could be directed to these events, as well as callers into our Website.

In addition to these open sessions at the Regional Centre, we also set up a programme of events in partnership with and at prestigious institutions in London, notably the Science Museum, the National Maritime Museum, the Natural History Museum, Shakespeare's Globe, and two events at a National Trust property, Sutton House to celebrate the annual Adult Learners' Week, and Black History Month.

We also had a range of support strategies to encourage students to develop their learning skills and make informed decisions, such as learning skills workshops; a language support programme; exams support; and course choice meetings. These complemented our on-line resources and telephone and Email support.

There are resource implications for all these events, and it has been important to us to know for the future their real impact, and to look at a range of information to decide how to plan our activities for the coming year. In addition, we wanted to ensure that everything possible was being done to ensure that these prospective students were well supported as they prepared to enter the University. It is notoriously difficult to get really accurate information clearly relating cause and effect, so it is helpful to use a range of research sources to do so. We have employed three main sources:

- Qualitative research using focus groups to identify what factors affected our students and how we could most effectively ensure progress from initial interest to successful study;
- Evaluation of all activities, for example, of our open events to ascertain how many attendees went on to register as students and remained with the course;

- Quantitative data, for example, on ‘hot and cold spots’ within London, that is, where we have more or fewer enquirers who continue on to become students, and how that relates to other statistical data, for example, on overall participation in Higher Education, on ethnic mix, or on income.

Each of these research approaches has its own benefits and limitations. Evaluation is essential to all activities for two main reasons: to ensure that an activity is meeting the needs of its clients in an inevitably changing context in the best possible way, and to ensure cost-effectiveness. Our experience shows that both small ongoing evaluation – sometimes the quick and simple one page asking participants what was good, what was bad, and what change they would like to be made - can be effective and easy to implement. Sometimes a much more thorough-going evaluation is needed, for example, to assess a large service rather than a one-off activity. On the whole, however, in-depth identification of needs is unlikely to be achieved through these processes.

Quantitative research can be extremely helpful in providing insights into trends and indeed revelatory in its impact, in a way that very small scale studies may miss. The impact of diagrammatic results can be powerful. It can, however, be misleading without further investigation; its main benefit is to highlight trends in a neutral fashion, which need further investigation if real understanding is to be achieved and appropriate action taken as a result.

Qualitative research can achieve a depth and subtlety which cannot be seen through statistics alone. However, it can also lead to false conclusions if the study is not scrupulously designed, and even then a sample can turn out to have unanticipated biases. Focus groups can be revelatory but also flawed.

Our experience is that each of these modes of research can provide a check and balance for the others. This is what we have hoped to achieve through our use of this mix of approaches.

An important example of qualitative research was carried out under the auspices of a major retention project within The Open University UK in 2001. Although London has consistently had a lower retention figure than any other UK region, we could not easily identify any particular pattern of performance that might explain the phenomenon or link it directly with London. The major part of the project used focus groups to try to discover whether students’ own qualitative perceptions of the experience of studying in London might reveal any significant factors suggesting that the conditions of urban life make successful study more difficult for students in The Open University UK. The summary below is drawn from the report on the project carried out and written by my colleagues Margaret Johnson (Assistant Director, Teaching, Guidance and Learning Development), Rosemary Mayes (Assistant Director, Student Services and External Development) and Brenda Stevenson (Student Services Manager, Advice and Support). (1)

A random sample of 200 students was selected. Selection criteria included gender, previous educational qualifications, and location. 4 focus groups were held, involving the 25% of the initial selection who had agreed to attend, of whom 90% actually participated. A standard format and topic guide was used for each group. The main study difficulties identified by students in all the focus groups fell into three categories:

1. **Those that suggested a clear link to London living conditions.** In this category three specific factors emerged strongly from all the groups, all to a greater or lesser extent related to work:
 - travelling time and conditions in London
 - long and often unsocial working hours
 - a high level of competitive pressure experienced at work.
2. **Those where a London link was arguable but less clear.** Issues in this category included problems relating to support from the Region, such as tutorial arrangements and relationships with tutors, and the difficulties often encountered by students trying to contact either tutors or the Regional Centre by telephone.

- 3. Those potentially common to all Open University students.** This area covered the difficulties associated with the general support provided by the University and such matters as the structure of the academic year, specific course issues, and the whole range of individual personal problems that can arise.

Many of the difficulties of OU study identified by the students taking part in the focus groups were such as might be experienced by any OU student anywhere. There were, however, some factors, in addition to these and other common ones, that a substantial number of the focus group participants linked to the conditions of living and working in London. The most frequently mentioned of these were the amounts of time spent on travelling in London, even for relatively short distances, and, for those employed outside the home, long working hours and competitive pressure experienced at work. While none of these conditions individually are unique to London students, it could be argued that they affect more London students more consistently. Several of the focus group participants spoke of coping with all three in combination and the words 'pace' and 'pressure' were used in this context.

These factors were also clearly seen as exacerbating others that might be common to all. So for example, the respondents who spoke of difficulties arising from the organisation of courses, such as the use of highly integrated multi-media components, found these more of a problem because of the length and physical constraints of their daily journeys on public transport.

Long hours of work and exhausting journeys have a knock-on effect on study patterns, leading, for some, to weekends and holidays having to be devoted to OU work and perhaps adding to the conflict between social and study demands and the strain mentioned on personal relationships. The few students who had understanding and supportive employers saw it as making a real difference and were very appreciative.

Accommodation and mobility patterns were also seen by some as a significant London factor: more frequent moves, more rented accommodation and, especially among younger people, more shared occupancy of houses and flats added to the difficulties of establishing stable study arrangements.

Open University UK courses are normally tutored by Associate Lecturers – discipline specialist teachers who work on part-time contracts for the University. Comments on the level and quality of Associate Lecturer and tutorial support provided by the Region included some very positive ones where tutors were felt to have been both accessible and helpful. However, there was also quite a lot of dissatisfaction, but it is difficult to determine the extent to which this might relate to London specifically.

However, links were again made between tutorial attendance and the difficulties of time, work and travel; the phrase 'struggling to get to a tutorial' was used in this context. The knowledge too that London tutors lead lives subject to the same pressures and difficulties made some of the respondents unwilling to 'bother' them in the evenings or at weekends thus perhaps cutting themselves off from some of the support that they might have called on.

For some students, a high level of on-line tuition or study was a difficulty. Students who spent the entire day working at a computer were reluctant to go home and log on again after a tiring journey, and were unable to use that journey to study if their course was mainly on-line.

In conclusion then, the focus groups suggested a set of factors that, working together to the extent found in the daily life of Londoners, may be significantly contributing to the London region's poor retention performance, but also gave us valuable information about the needs of our students in London and the factors we must take into account in planning activities and support for them.

The second research tool we use is that of internal evaluation of all activities, embedded in the work of the teams which organised them. This has enabled us to evaluate the cost-effectiveness of each activity, to make improvements, and to reduce costs where possible. The example I will give is that of an evaluation of our Open Wednesday drop-in sessions. This was carried out by my colleague Trixie Carey, Senior Student Services Assistant, Courses and Enrolment. (2)

At these drop-in sessions, attendees registered on arrival and provided either an Open University Personal Identifier, if they had already contacted us, or a postcode. Many who attended wanted to look at brochures, materials or our Website (we have 3 PCs with access to our Internet sites available in our reception area) and did not register on the day, but were given relevant help at the session. In addition some students withdrew from unsuitable courses after talking to an adviser. Some sessions were nearer to final enrolment dates than others; there were inevitably higher registration figures at and after those events.

Using Management Information from the University's database, the evaluation followed up all attendees who had already formally enquired, 7 months after the course start date, and found that 57% of them were still actively studying at this stage – 237 out of 418 potential students. This conversion rate from enquiry to active studentship so far into the course is exceptionally good. In addition, evaluation questionnaires were sent or handed to all 418 students, and there were a number of suggestions for improvements: for example, more materials were requested, and more advisers were needed to reduce the waiting time (an average of 18 minutes – a result of the much greater than expected attendance which has continue to grow steadily from an average of 45 to - since this evaluation - 95 at the last meeting).

Finally, we have recently been looking at some initial London-related findings of a mapping project funded by the University's Widening Participation programme. The project is based on data maps which show participation down to local polling districts, in comparison with population data sets. We have been exploring the potential use of mapping in marketing, planning and partnership activities. My colleague Dr Judy Stone, working with the London Regional Collaboration and Partnerships Team, has analysed the data for us. (3). Some interim, fairly tentative indications are that enquiries to the Open University UK per 1000 are fairly consistent across all parts of the city; and that 0.5% of the population in London is registering for an Open University course. This is surprisingly even regardless of the degree of deprivation of the area. However, at the very local level we were able to identify some 'cold spots', where we have fewer enrolments, and the areas where we have the highest numbers of enrolments from young students and those from ethnic minorities. We are still considering the use we can make of this information and how we can refine it.

So what impact have these three examples of different kinds of research had on our strategies for recruitment and retention? Very briefly, it has shown us that, despite the increasing use of the University's Websites for advice and information, we do need to continue to capitalise on our excellent location, since, given the problems of travel in London, students and enquirers find it convenient to get to. However, once they have arrived, the service needs to be fully geared to their needs, with appropriate materials and fast access to an adviser, and this may require a shift in our priorities for use of staff time. We still have work to do in achieving the right balance between Web based, telephone, Email and face-to-face advice and guidance.

The advice given also has to provide a realistic indication of the workload involved in studying with the Open University and guidance on strategies for managing time and studying efficiently, and these have to be reinforced by the provision of learning support once enquirers become students, which we also have to prioritise. An important recent initiative is a Web-based resource for OU students (www.open.ac.uk/learning), to help them get the most out of their studies, with links to the Learners Guide and other Websites. It includes advice on getting started, study strategies, planning studies, personal and career development, and moving on.

We also have to help our Associate Lecturers, through focused staff development, make the best use of their time, understand the importance of their role in student retention, and make strategic interventions (for example, with a welcoming introductory letter) when it makes most difference to students. This includes guidance on the use of on-line conferencing, tuition and Email, which has raised a number of questions recently about the impact of these media on student support.

Finally we hope to find out where Londoners (especially those we want to attract because of their low participation in higher education) aren't becoming Open University students, why this is so, and what we can do about it.

There is no single source of research which can provide all the answers. However, there are clear indications that a combination of qualitative, evaluative and statistical research (especially if carried out by active practitioners, as in all my examples, who are able to draw the most relevant insights from the research outcomes), can help to put together a practical and effective strategy for recruitment and retention. In this case study, we have taken advantage of a large scale University-wide project to find high level information about trends in London. We have been able to set this alongside our small qualitative Retention project and our own evaluations of regional activities, but inevitably our lack of control over the larger project has resulted in a less integrated set of overall data. Our hope is that in future we may be able to design an overarching project, ideally year on year, combining these three approaches, in such a way that they interlink and are fully complementary.

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Author:

Judith Fage
The Open University in London
1-11 Hawley Crescent
London NW1 8NP
UK

THE ROLE OF STUDENT SUPPORT SERVICES IN ELEARNING SYSTEMS

Desmond Keegan, Ericsson, Ireland

Overview

This paper studies the role of student support services in elearning systems.

elearning is defined as the provision of education or training electronically, via the Internet.

The term 'student support services' is used for those parts of a distance or electronic learning course which are additional to the provision of course content. These student support services can be either 'learner support' or 'learning support'.

Learner support comprises all the assistance provided by a distance education or an elearning system which matches the facilities which a face-to-face system provides for the success of its students.

Learning support lists the assistance provided by the institution in the actual process of learning to ensure that the learning tasks are performed successfully.

Role of student support services in distance education

Student support services played a crucial role in the success of distance education; it is reasonable to expect that they would play a decisive role in elearning too. The success of distance education came when it was accepted that nationally and internationally recognised university degrees, college diplomas and training certification could be won at a distance.

The first 100 years of distance education were fraught with difficulties. Distance accreditation was not accepted, the correspondence image was rejected, university professors criticised education at a distance.

It was not until the foundation of the open universities in the 1970s that this image began to change. Although the course materials produced by the Open University of the United Kingdom, the FernUniversität in Hagen in Germany and the Universidad Nacional de Educación a Distancia in Madrid, Spain were highly praised, it was the student support services and feedback provided by these universities that enabled distance education to come of age.

An important distinction was between Teach Yourself Books and Distance Education Courseware. Pedagogically, Teach Yourself Books provided the reader with information on the subject matter from which the student learned. Absent was, however, interpersonal communication and feedback on learning endeavours which had always been seen as an integral part of the learning process. The better distance education institutions provided interpersonal communication and feedback, as well as course content, by a range of facilities known as student support services. The role of the student support services was to guarantee the validity of the educational process by providing structures for interpersonal communication and feedback in the distance education system.

Student support services were crucial in the accreditation process of distance education courses and the decision of national and international bodies to award university degrees, college diplomas and training certification for studies done at a distance. There never was question of awarding degrees, diplomas or certificates for Teach Yourself Books or Packages but it was one of the great successes of distance education that gradually nationally and internationally recognised certification was awarded for distance education courses, even at degree level. Today a B.A. Open degree from the British Open

University is as valid a degree for employment purposes or for post-graduate research studies as a degree from another British university.

Analysis of student support services

A grid developed for the analysis of student support services in elearning by the Socrates project 'Student Support Services in elearning' identifies clusters of tools under the headings 'learner support' and 'learning support'.

The learner support grid comprises:

- Information Phase
- Guidance Phase
- Registration Phase
- Integration Phase
- Final Results Phase
- Accreditation Assistance Phase
- Guidance on Further Study Phase

Learning support lists the assistance provided by the institution in the actual process of learning. This is the Learning Phase which facilitates online learning. Online learning typically occurs via access to elearning content, discussion forums, bulletin boards, email queries, telephone support, group work. These structures support both student to student and student to tutor interaction.

Included might be:

- Dispatch of printed and other physical learning materials
- Instruction on Online Learning techniques
- Bulletin Boards. Online discussion rooms for all users to post comments, questions, learning support documents etc.
- Email. The facility to contact tutors and / or peers.
- Online tutorials. Online tutorials to support students in meeting their learning objectives.
- Face to face tutorials. The facility to arrange online, face to face tutorials that support the students in meeting their learning objectives.
- Resources / Library. Online access to additional material to support student learning.
- Student - Self Assessment. The online facility to check learning progress during the course. The results of these tests are not usually recorded towards the final result.
- Automated Assessment. Typically occurs at the end of a course, produces a result which may count towards certification.
- Tutor Assessment. The facility to send work to a tutor / teacher for correction and evaluation.
- Assessment Feedback – electronic
- Assessment Feedback – manual
- Student Portfolios. A personal home- page per student to allow them to introduce themselves to online colleagues, showcase their work, provide alternative sources of course information to colleagues.

The analysis of Tait

Tait (2003) of the Open University of the United Kingdom gives a reflective analysis of the role of student support services in distance education. He asks:

What then are the main reasons for having student support integrated in an ODL system?

Students want support

The first of these is that students want it. While this might be said to be pedagogically weak in the theoretical sense, it is important for the best of reasons. In the OU UK student feedback tells us that some 10 per cent of students do not want interaction with other students, having perhaps a personality type that has led them to choose a study mode that reduces or removes the need for interaction with others. However, for the other 90 per cent, this is looked for, albeit not always taken up because of the demands on time and place that are so prevalent in the lives of adult learners.

The reduction of drop-out

Student support, especially student guidance and counselling, tutor support, and effective information and administrative systems all provide a range of activity that impacts not only in terms of teaching but also affectively, that is to say reinforcing the student sense of confidence, self-esteem and progress.

The nature of learning

A further mode of explanation for student support, especially for tutoring in group work in study centres or online and in the teaching given through the return of assignments, lies in the impact this makes on the learning process. Essentially this has been termed 'mediation,' that is the role that the tutor performs in relating the teaching content to the student as an individual in her or his situation, including the social, economic, geographic and cultural dimensions.

The statistics quoted by Tait from the Open University of the United Kingdom are impressive. Many years ago the Swedish scholar, Bååth, had argued that there were four types of students enrolled in distance education systems:

We have four categories of students; there are

- students who need student support services but don't want them
- students who need student support services and want them
- students who don't need student support services but want them
- students who neither need nor want student support services. Tait has shown that the last category at the Open University of the United Kingdom numbers less than 10%.

The avoidance of avoidable drop-out has always been a goal of distance education systems, which are often compared with conventional colleges and universities in spite of the fact that their students are normally older, have families and are in employment. There can be little doubt that at the Open University of the United Kingdom in particular, the rich provision of student support services solved the drop-out problem and this contributed greatly to the status of distance education worldwide. Tait's argument from the nature of learning is an important one. The provision of feedback is an important dimension of the education process and feedback on student work is a characteristic part of student support services.

The analysis of Thorpe

The identification of student support services in elearning LMSs has been commented on by Thorpe, of the Open University of the United Kingdom. She writes:

The use of computer-mediated communication (CMC) as an integral part of the design of distance taught courses raises interesting challenges to our thinking about course design and learner support.

These have typically been conceptualised as two complementary but distinct systems in distance education, characterised by different practices often carried out by different groups of staff. Where CMC is designed as an integral part of the course, with collaborative learning as essential to assessment and study, this separation breaks down. The design of online activities is integral to both learner support and the course content, with new possibilities for open and distance learning as a result. Where the learning group itself is a resource for study and personal development, it also becomes feasible to orientate courses and programmes towards local teams and communities. Online tutors play a key role and need to develop 'the technology of conversation' and expertise in the design of activities, as part of their facilitator role.

Thorpe's position that 'Where CMC is designed as an integral part of the course, with collaborative learning as essential to assessment and study, this separation breaks down. The design of online activities is integral to both learner support and the course content' is not accepted here. It is believed that it is still possible to identify course content development and student support services as component parts of an elearning system.

There are three reasons for this:

- Some elearning systems are today rich in student support services and some are not
- It is possible to identify in functioning elearning systems today clusters of activities which match the definition of student support services
- There is a clear distinction in elearning theory today between Learning Management Systems (LMSs) and Learning Content Management Systems (LCMSs).

It is clear that some elearning systems today are rich in student support services in a way which others are not. The NKI (Norway) system is particularly rich in student support services. Theoretical and technical justification of this richness is fundamental to the organisation. In contrast to this many corporate implementations of elearning are fragile in student support services and tools for these services, if present in the system, are little used. Thus, it is felt, that Thorpe's assertion that 'the distinction between course content development and student support services breaks down in elearning' goes too far.

In a similar way it can be demonstrated that the student support services in an elearning system can be identified and analysed. The grid developed for this purpose identifies clusters of tools under the headings: Information phase, Guidance phase, Registration phase, Integration phase, Help desk, Learning phase and Final results phase.

These facilities are either present or not in an elearning system and the system can be analysed to evaluate and measure the degree of use of the facilities. The tools listed under the heading 'learning phase' are central to the richness or otherwise of student support services.

In a similar way the Learning Content Management System focuses on the provision of course content and the Learning Management System clusters the other services that are provided as a support to the student.

The two worlds of elearning

In conclusion it is already clear that elearning comprises a new sector of education and training provision today. Industry analysts put its value at \$/€3 billion in 2003 and state that it is set to grow \$/€18 billion by 2005.

This world is split into two halves: corporate elearning training provision and university/college elearning education provision.

Corporate training provision on the WWW is a rapidly growing industry, characterized by the leading American LMSs, like WebCT, Blackboard, Saba and Learning Space, regulated by American

standards like SCORM 1.2, providing training certification and using either asynchronous elearning or synchronous systems like Centra Symposium.

University/college provision is less dominated, at least in Europe, by American LMSs and standards and makes little use of synchronous virtual classroom systems like Centra. It offers university degrees and college diplomas and 70.000 such courses are listed on the TeleEducation, New Brunswick portal at <http://courses.telecampus.edu/subjects/index.cfm>.

The two halves of elearning have different attitudes to student support services. College and university systems, like NKI in Norway, are often designed to be rich in student support services and the provision of rich student support services is a central factor in the college or university's business model. Corporate systems, on the other hand, can be based entirely on man/machine interfaces.

This was demonstrated by a questionnaire developed for students in the Socrates Minerva project 'Student support services in elearning'. This questionnaire was answered by a grouping from NKI, Norway representing academic students and a grouping from the Ericsson International Training Centre in Dublin, Ireland representing corporate students.

The responses from the two groups to the series of questions on the usefulness of the various student support services detailed are remarkably similar. This may, however, be just the recognition in an educational or training context that major features of a training system are 'good things' and that few would wish to rank them as unimportant or not important at all.

There are, however, striking differences between the corporate students and the academic students when asked about their satisfaction with the various elements of the student support services. In particular the series of answers from the corporate students which record large percentages in the never used/unavailable category is significant:

Information relating to the larger program	30%
Information relating to pricing	38%
Information relating to costs and grants	44%
FAQ section on registration	30%
Access to technical support services	41%
Support regarding registration	33%
Ability to contact tutors	52%
Ability to contact other students	63%
Discussion forums	61%
Online tutorials	33%
Tutor access	66%
Feedback on assignments	63%
Advice on further study	56%

Table 1. Percentage of responses of corporate students in the 'Never used' category

There are marked philosophical differences between the design of the courses for the academic students and the corporate students. The design for the academic students clearly states: 'The elearning philosophy of NKI in Norway is clearly expressed as 'access to a tutor is perhaps the element that most clearly distinguished online distance education from "Teach yourself e-learning packages". It is thus expected that students who have chosen to register in and also pay for e-learning as offered by NKI as distance learning on the Internet consider the tutor to be important' and again 'in the NKI development philosophy for elearning assignments and tutor comments, evaluation and feedback on assignments are seen as one of the most important elements'. It can be stated that such preoccupations do not characterise the courses prepared for the corporate students.

We may be witnessing a parting of the ways in elearning between corporate elearning and academic elearning.

Tait's three rules for the provision of student support services break down. 'Students want support' is not proven. Courses tend to be short and focused on technical knowledge. Chatting is not a requisite. Email and bulletin boards, if provided, are not used. The 'reduction of drop-out' is not a factor as courses are often done in company time and are a requirement for career progression. The 'nature of learning' is different in training and education settings and this argument too does not convince corporate providers to include rich student support services in their elearning courses.

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Author:

Desmond Keegan
Ericsson, Adelphi Centre
Upper Georges Street
Dun Laoghaire, Ireland

PREPARING STUDENTS FOR LEARNING IN AN ONLINE WORLD: AN EVALUATION OF THE STUDENT PASSPORT TO eLEARNING (SPEL) MODEL

Francesca Lorenzi, Kay Mac Keogh & Seamus Fox, Dublin City University

Introduction

In the extensive and on-going discussion on the potential of ICTs in education, one major stakeholder is often overlooked, the student (MacKeogh 2003). Reports and documents promoting the potential of elearning are replete with references to ‘users’ of educational technology, referring to institutions, teachers, employers, and governments, while the readiness of students to learn using these powerful new technologies is frequently ignored. In this paper, we review the work of Oscail – the National Distance Education Centre in Ireland, in developing its student-centred strategy for introducing ICTs in its distance education programmes. Since its inception in 1982, Oscail has evaluated the potential offered by technology for the delivery of its programmes, in tandem with monitoring access to technology among its students. While ownership or access to PCs and Internet are now virtually ubiquitous among Oscail students, other divides are becoming apparent, in terms of knowledge, expertise and attitudes (MacKeogh 2003). The paper briefly outlines the way in which Oscail has developed its technology strategy. We then summarise the outcomes of research on student readiness to learn using technology. This research has identified the need for a programme specifically designed to prepare students for learning in the online world. The paper will conclude with some comments on the issues involved in supporting students in the new elearning environments.

Introducing technology – strategic considerations

Oscail has been the major provider of ODL in Ireland since 1982. While Oscail is a faculty of Dublin City University, it has a national remit to extend access to qualifications to adults throughout Ireland. Oscail provides graduate and post-graduate education both for those who have previously not had access to education (second chance students) as well as to those seeking to upgrade their qualifications. Qualifications are offered in information technology, the humanities, nursing, and management. Undergraduate programmes are open to adults aged over 23 years, regardless of qualifications, although all students are required to complete introductory modules before admission to credit modules. Postgraduate students are required to hold undergraduate degrees or professional equivalent. To date, Oscail has used mainly ‘second generation’ distance education technologies in delivering its courses, utilising a mix of correspondence texts, video and audio tapes, some computer based learning and supported by face to face tutorials in a distributed network of study centres. This policy has been dictated by considerations of cost, accessibility and concerns about the pedagogical quality of most of the technologies which have been proposed over the last twenty years.

Nevertheless, Oscail has been deeply involved in monitoring and analysing trends in technology in education for many years (see for example Curran and Fox 1999 and Curran et al 1995). At the same time, annual surveys showed that the level of access to technology by students, who are widely dispersed throughout Ireland and abroad, was insufficient to convert Oscail programmes to ‘third generation’ modes of delivery. To do so would have meant erecting substantial barriers to our students and reducing enrolments while possibly not adding significant value to our courses.

By the late 1990s national, international and global developments suggested that the time was at last opportune for Oscail to introduce ICTs into teaching its programmes. Since then, with the greater accessibility of virtual learning environments and expanding access to PCs and the Internet in the student population, technology has increasingly been used to enhance pedagogy. In 2001, Oscail introduced its Master of Science in Internet Systems programme. This programme is presented totally

online, with students accessing course materials and online tutorial support via the WebCT virtual learning environment. With EU funding under the Minerva programme, an innovative form of structured support for online learning has been developed, initially for modules on the BA programme (Fox and MacKeogh 2001). This model aims to use the capability of the technology to develop higher order skills, in a cost and pedagogically effective manner. Since 2003, most modules at degree level in the BSc in Information Technology are presented online.

In the next phase it is planned to integrate the ICTs in all aspects of Oscail's programmes, administration, pedagogy and assessment, moving towards the ideal of a constructivist approach to learning, and enhanced flexibility for students. It is hoped that within the next five years, students can enrol online, access course materials and resources, and tutorial support, interact in a collaborative environment with their fellow students, and participate in range of assessment modes, including peer and self assessment.

The challenges to moving this strategy forward can be summarised in terms of cost, access, skills, perceptions, and quality. Among the ways in which the Internet and virtual learning environments can improve quality is by providing off-campus access to learning resources, both on the WWW and through online journals and full-text databases. All Oscail students can now log on to the journal databases provided by DCU library from their own PC and download a wide range of full-text articles and documents, thus solving one of the perennial problems of distance education students who cannot access the campus library. Nevertheless, many Oscail students operating from a broad range of environments have experienced great stress and frustration in trying to utilise these resources off campus, for a range of technological and expertise reasons.

Another way of using ICTs to improve learning is to tap into the potential to develop higher-order cognitive skills such as problem-solving, critical thinking, analytical skills and collaborative team working skills, all skills which are difficult to develop using conventional text based distance education delivery. The EU Minerva project referred to above was designed to test a range of online pedagogical techniques & methods which minimise demands on tutor time and simultaneously promote higher order learning. The report of the pilot phase of this project concluded that 'given the appropriate online pedagogical techniques, students will (more or less) by themselves ... display evidence of engaging in higher-order learning. However, further work is required ... before anything categorical can be said about the potential of eLearning to enhance higher-order learning at reasonable cost.' (Fox and MacKeogh, 2001: 1). More recent extensions of this model indicate that while quality increases, so also does the cost of provision.

Another challenge to be faced is the readiness of students to engage with elearning. Earlier studies have consistently identified expertise as a key factor in creating positive attitudes to technology. In 2000 a survey of Oscail tutors and students found that proficiency varied with the type of technology (Mac Keogh, 2001). Tutors and students rated their skills in word processing, email and WWW relatively highly, but had little expertise in data manipulation, including spreadsheets. A survey of students carried out in 2002 identified a similar pattern of varying levels of expertise. In particular low levels of expertise in computer conferencing were reported (MacKeogh 2003). With regard to attitudes to using technology, almost one fifth (19.2%) of students opted for traditional forms of ODL, without any technological element, while only 11.6% opted for elearning (defined as a mix of written course materials, online materials, online tutorial support and interaction with students and tutors). The majority favoured using ICTs to enhance existing modes of learning, and there was substantial resistance to removing face-to-face and personal contact from the learning experience, even among those who were supportive of technological enhancement.

Arising from the research on attitudes and expertise of our students, as well as evaluation of the experiences of students studying course modules online (see Fox and MacKeogh 2001), it becomes clear that if students are to benefit from the undoubted advantages of elearning, a system of support is required which integrates skills training with academic content, designed to prepare students to succeed in elearning, as well as to enjoy the experience. To this end Oscail has designed two preparatory online modules which aim to integrate the technological skills required for elearning with an introduction to the academic content students will encounter in either the Humanities or

Information Technology undergraduate programme. The Irish Higher Education Authority has funded development of these modules – the Student Passport to eLearning (SPeL) - as the aim is to extend the model to other disciplines in Irish higher education. The first modules were presented between December 2002 and January 2003. The outcomes of the evaluation of the pilot phase is outlined in the next section.

Evaluation of the SPeL modules

All students entering Oscail undergraduate programmes are required to take a short introductory module. This module serves a three-fold purpose, it helps students to update or acquire skills for studying at University Level; it provides a ‘taster’ of distance education and give students the opportunity to try out the format without committing themselves to a long course; it also gives a general introduction to the discipline. In the traditional mode of delivery, this module uses conventional text based material, supported by face-to-face tutorials. Students complete assignments designed to allow them practise their study skills within a disciplinary context. For the pilot version of SPeL, applicants to the undergraduate programmes were invited to volunteer to participate in the online version of the introductory modules. 40 students volunteered for SPeL Humanities and 32 volunteered for SPeL IT. Students ranged in age from 24 to 55 years. As might be expected, the majority of Humanities students were female (60%), while the majority of IT students were male (70%).

The Pedagogical Approach

With the SPeL modules, no face-to-face tutorials took place. Instead students were led through a carefully designed journey using a detailed roadmap, carrying out specified tasks, and interacting with their tutor and fellow students within the WebCT environment. Students were required to read course materials, participate in on-line activities, post messages to a discussion area and carry out assessment tasks based on both their readings and on-line activities. Students enrolled for both Humanities and IT were required to produce a final portfolio which consisted of all the assessment tasks and print-outs of their on-line activities. The portfolio was submitted to the tutor who was moderating the on-line interaction.

The SPeL modules introduced students to the use of the on-line medium through carrying out tasks which gradually acquainted them with on-line resources such as e-mail, internet search engines, computer asynchronous conferencing communication, web based library databases and basic software packages such as Microsoft Word and Excel. The SPeL modules can be described as task-oriented programmes. It was envisaged that these tasks would “accommodate objectives ...seen by learners as directly in harmony with their own perceived and stated learning needs” (Breen, 1987: 28) and while motivating them to engage with the course content while acquiring study skills. A scaffolding approach to task-design was chosen as the one more likely to succeed in gradually introducing students to use of electronic media. Students started off with simple tasks such as posting a message to introduce themselves and progressed to more complex ones such as searching and reviewing websites, and entering data on the learning experience in an Excel spreadsheet and finally analysing the learning experience in both quantitative and qualitative terms. Scaffolding was applied to enable students to progress gradually and this helped to ease some of the initial anxiety associated with use of technology, particularly for the Humanities students who initially appeared to have less experience in using ICTs. In other programmes computer skills have been an add-on, often in the form of an ECDL-type separate course. However, it was felt that in order to optimise the acquisition of computer skills it was necessary to integrate technical knowledge acquisition with study skills. Furthermore technical knowledge and study skills were applied to course specific content and this gave students the opportunity to acquire an initial understanding of the subjects they wished to undertake at undergraduate level.

Students were also asked to reflect on the learning experience and to maintain both a learning log and a reflection diary. This added a metacognitive dimension to the experience and helped students to develop greater self-awareness in terms of time management and learning style. As Monteith and Smith suggest “Learning ‘online’ in an open-access resource centre, where there is the almost

permanent option of crossing the boundaries between the social environment, requires students to adopt greater self-discipline and different study skills from traditional forms of learning” (Monteith and Smith 2001: 123). Having to reflect on a daily basis on the learning experience helped students to counterbalance this tendency and as one humanities student reported “On week one when I printed off the material I was overwhelmed. But now I am glad I did this course, because I have gained loads of knowledge with reference to my computer and of course the course content. This will help me with my future study skills... The daily log was useful as it showed me what I had done that day, and what other areas I should spend more time on. The study schedule was helpful but I had to be very flexible with reference to adapting my study time around my children, husband and other factors which influence my life”.

Online student support

It can be argued that the factor which most contributes to the success of online learning is the level of support offered to students. Four broad categories of support can be identified: 1) Support as learner-centred instructional design; 2) Support offered by tutor; 3) Support offered by peers; 4) Technical support

Learner-centred Instructional Design

From the outset, the design of the SPeL modules was not technology driven, rather it focused on learners’ perceived needs as identified through evaluation of learner experiences. As Jung points out “It is instructional design not technology, that is at the centre of quality distance education” (Jung 2000: 1). Laurillard suggests that students in an elearning environment may need mediated access to information (Laurillard, 1996). Bearing those concepts in mind and given that no prior knowledge was assumed, students were provided with a manual with a detailed description of weekly tasks which framed activities in a general plan. This gave students a sense of structured progression. Students were also able to download from WebCT a Study Skills Handbook and programme specific self-instructional text. The content is presented in dialogical and student friendly form. The texts offer plenty of opportunities for reflection and encourage students to self-assess their knowledge and understanding before progressing further. The course materials serve as the foundation for the on-line activities as on-line discussion topics are based on them. For instance one of the Study Skills Units deals with information gathering and evaluation and the on-line activity connected to it requires students to log on to the web to search for three websites related to a specific topic (for example, identity) and evaluate their quality and usefulness. The activity therefore links the skill (information gathering) with the course content with the technical knowledge (how to access a website). The integrated approach ensures that there is a parallel progression in, skill, content understanding and technical skill acquisition.

Tutor Support

The tutor is key to the effectiveness of online programmes. The tutor keeps the discussions structured and focused and motivates students at times when technical difficulties appear to prevail. In the SPeL modules, tutors could interact with students in the general discussion area or when more personal issues had to be addressed they could choose to email individual students separately. Of the 584 messages posted in the humanities discussion area, 26 were posted by the tutor, compared with 28 messages posted by the IT tutor out of a total of 103 messages. A closer look at interactions and tutor contributions reveals that the humanities tutor used messages to direct and structure general discussion, leaving room for extensive peer interaction. In contrast, the IT tutor tended to reply to students on a one-to-one basis in the general discussion area with substantially less interaction between students. While tutors vary in their approach, the nature of the discipline is also of significance in determining the form of the interaction. The humanities tutor invested in structuring and consolidating activities. This approach was dictated by the need to keep the discussion focused, which was often an issue given that humanities students frequently failed to follow threaded discussions and posted long messages. The discursive nature of the humanities course content favoured longer contributions and it was essential for the tutor to remind students of the topic and function of the discussion. A rather different scenario is offered by the IT interactions. The IT tutor

spent time encouraging students to interact and this explains the high proportion of social and one-to-one contributions. The less discursive nature of the subject matter in the IT programme meant that students' contributions were shorter and often did not go beyond mere statement of fact. The tutor often reminded students of the task and primarily provided instructions and practical advice.

Support offered by peers

One of the most convincing arguments for introducing elearning is its potential to provide the social interaction missing from conventional text based distance education. One student at the end of the module wrote that she was "going to miss this little community", another added that she was going "to miss the discussion very much", one student felt that "reading other people contributions gave [him] confidence to carry on". Those comments summarise the general feeling that emerges from reading the messages posted in the general discussion area. Student truly engaged in the on-line discussions and a sense of community was generated by the constant interaction.

Analysis of the online interactions for both SPeL modules shows that most of messages were posted by students. The classification of messages is not straightforward. Often messages carry more than one communicative function. In analysing these interactions, a discourse analysis approach was taken (Brown and Yule 1983) and for the purpose of analysis the interactional value of the messages was chosen as a key to the interpretation and classification. Those messages with low interactional value, such as two-line messages accompanying posting of a task, were classified as "other" and were not analysed for the purpose of this study. Student interactions were classified according to Salmon's five step on-line teaching and learning framework (Salmon 2000, 2002). Messages could be classified as offering moral support and social interaction (28% humanities; 50% IT); technical advice (11% humanities, 7.5% IT); sharing information (12% humanities, 13% IT); knowledge construction (12% humanities, 0% IT); other (31% humanities; 28% IT). From these figures it can be seen that a large proportion of messages served the purpose of getting students to know each other and the high level of social interaction was a motivating factor for more reluctant students. Moral support offered by peers was particularly important when technical or administrative problems appeared to undermine the smooth running of the programme. Knowing that the other students were experiencing similar problems helped some to stay on board and build bonds with peers. IT students appeared to provide each other with less technical advice, as most likely, they had sufficient technical knowledge to be able to deal with technical issues on their own. On the other hand, humanities students often offered a word of advice to their peers particularly because the level of technical expertise varied greatly among humanities students and those more experienced willingly offered help. While students were explicitly asked to offer feedback to their peers on activities posted in the general discussion area, the level of feedback offered is still quite limited and this might be explained by a certain degree of embarrassment in criticising their peers. In most cases students only offered positive feedback. It might be argued that peer feedback was not necessarily perceived as a form of support by students unless it was offering positive feedback.

Perhaps the second most important aspect of the interaction among peers was that of sharing information. The information shared ranged from valuable web addresses, to advice on how tasks should be carried out to simply sharing frustration when the postal delivery of one of the course texts had been delayed. According to Salmon (2002) when constructing knowledge students interact with course content and with each other in a critical, and creative fashion and the humanities interaction offers evidence of exchanges moving beyond mere regurgitation of course content. Peer support in this case can be seen as progressive activity whereby the analytical and critical interaction with the course content is enhanced by interaction with peers. Humanities students managed to move to this level of interaction while messages from IT students offer little or no evidence of this type of interaction. This might be explained by various factors. The discursive nature of the humanities might have helped and perhaps, in general, the greater level of interactivity in the humanities area might have also contributed to building a sense of community which might have led to greater ease in interacting with each other at a more analytical level.

Technical Support

Students were provided with an online step-by-step manual to help them to use WebCT that could be downloaded and printed off. The manual was designed specifically for this programme and its simple and non-technical language made it approachable even by those students with no previous technical knowledge. Students were also provided with a personal email address, password and username and could access the Dublin City University library resources. Students could also contact by email or phone the Oscail Technical support team and this was a key element at a stage when students were unable to use the on-line databases for a brief period of time. However, as discussed above, in most cases technical support was offered by peers and students chose to contact Oscail when they could not resolve issues themselves or with the help of the tutor.

Outcomes

Students who had successfully completed the pilot SPeL module assessment tasks were eligible to enrol for undergraduate programmes. At the end of the modules, some 70% of IT students and 52% of humanities students successfully completed the programmes. While the reasons for non-completion are the subject of more intensive investigation, this is, nevertheless, quite a satisfactory result and compares favourably with the completion rate of the traditional face-to-face version of the Introductory Modules. Some more advanced technical ability might have resulted in a higher completion rate for the IT students, however only a more detailed analysis should establish whether the technology, the pedagogical approach, content or other factors have influenced the retention rate. Interestingly, in following up the pilot SPeL students as they proceed through their first undergraduate modules in 2003, a higher proportion of both humanities and IT students successfully submitted their first assignment compared with students who had followed the conventional version of the module. It should be noted that the first assignment for undergraduate is due very early in the Academic Year and the input of Credit Module tutors is minimal. It might be suggested that the on-line introductory module students might have contributed to enhancing students' confidence in their skills and ability to meet deadlines. A more detailed analysis of the student behaviour for the duration of the first academic year is underway.

The SPeL modules have been revised in the light of the evaluation of the pilot modules. The second version is currently being presented. The SPeL IT programme was modified to place less emphasis on content and more on activities in which students have to interact. The outcomes will be carefully monitored. In particular, it will be interesting to see if these different tasks in the modified SPeL IT increase the number of interactions which aim at sharing information and knowledge construction. The overall strategy is to finetune the approach in respect of humanities and IT before expanding the model to other disciplinary areas

Summary

This paper has indicated the crucial need to ensure that students are ready to learn through elearning. The skills for learning are not necessarily innate, and in particular, the skills for learning with technology need to be recognised and made more explicit. Of course these skills cannot be learned in isolation from the disciplines in which they are exercised and different approaches are required for different disciplines. However, regardless of discipline, the development of preparatory courses for students to equip them with the skills for elearning is essential if maximum benefit is to be garnered from the potential of this exciting means of teaching and learning.

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Authors:

Francesca Lorenzi, Kay Mac Keogh & Seamus Fox
Oscail – National Distance Education Centre
Dublin City University
Glasnevin
Dublin 9
Ireland
francesca.lorenzi@dcu.ie
kay.mackeogh@dcu.ie
seamus.fox@dcu.ie

STUDENTS' NEED FOR AND SATISFACTION WITH SUPPORT SERVICES IN E-LEARNING

Torstein Rekkedal & Svein Qvist-Eriksen, NKI Distance Education

Introduction

This paper reports from an evaluation study among NKI Internet students. The study was carried out as part of the project, *Student Support Services in e-Learning*, supported by the Socrates Minerva Programme of the EU Commission. The other partners of the project have carried out similar evaluation studies. For reasons of comparison between different countries, institutions and systems, the quantitative part of the evaluation instrument was, except for language differences, identical with the one used in the studies conducted by the other four project partners, Ericsson Competence Solutions and Cork Institute of Technology in Ireland, FernUniversität in Germany, University of Rome III in Italy.

Definitions

The project deals with the role of student support services in e-learning. In the literature there seems to be as many definitions of e-learning as there are writers on the subject (see e.g. Rekkedal & Qvist-Eriksen (2003), Súilleabháin (2003)). In the project 'e-learning' is defined as "...the provision of education or training electronically, via the Internet". The term 'student support services' is used for "...those parts of a distance or electronic learning system, which are additional to the provision of course content" (Thorpe 2001).

NKI Online Distance Education

NKI online distance education (or Internet/web based e-learning)

NKI was probably the first European online college, and it has offered distance education online every day since 1987. Few - if any - online colleges in the world has been longer in continuous operation.

NKI Distance Education has today well above 300 courses and more than 60 complete study programmes on the Internet. October 2003 we had 5,800 registered active students. Contrary to many other educational providers, where the Internet is used as a supplement to face-to-face teaching or other forms of distance education, we have followed the philosophy that in principle all communication can be taken care of through the Internet, and ideally no obligatory physical meetings should be required. (This does not mean that the students are not free to communicate by post, phone or fax or that study materials includes print, audio or video technologies.)

NKI Internet College '4 Generations' of development

The NKI Internet College has been developed through 4 systems generations:

1987 - 1994: '1st generation' based on the conferencing system 'EKKO', a menu based conferencing system designed by our in-house systems developers as no other options were available that could be installed on the mini computer in NKI at that time. The idea was that we through 'electronic means' could establish a virtual school and be able to simulate electronically all communication needs previously organised through solutions of combined distance teaching and local face-to-face classes.

1994 - 1995: '2nd generation' – 'the open electronic college' with the underlying philosophy of offering a system as 'open as possible to other networks and services based on the Internet, e-mail and Listserv conferencing' system.

1996 - 2001: '3rd generation' – the introduction of graphical interface and the WWW, taking the step from 'small scale experiments to large scale Internet based distance education', introducing courses and programmes below university and college level.

2001- : '4th generation' – In our experience, it is the step from small-scale to large-scale operation that involves the greatest challenges. Putting some teaching material on the Internet and offer one single course is not a very difficult task. The great challenge is to develop and administer an Internet based teaching organisation offering a large number of courses with high quality to a large number of participants on a continuous basis. This is why we experienced a great leap forward when we March 2001 launched what we characterize as the '4th generation' with the introduction of *SESAM (Scalable Educational System for Administration and Management)*. SESAM is our internally developed learning management system completely integrating the teaching-learning system on the WWW with our overall student administrative system (STAS). The learning management system and the student administrative system together form the basis for the complete system of student support services.

Didactical solutions for distance teaching and learning

Based on theory and research from the field of distance education, included our own research, NKI has chosen this basic philosophy for the development of Internet based education at NKI: *Flexible and individual distance teaching with the student group as social and academic support for learning*. NKI recruits thousands of online students every year. These students may enrol in any of the more than 60 study programmes or 300 courses or in any combination of courses at any day of the year and progress at their own pace. This flexibility does not exclude group-based solutions in co-operation with one single employer, trade organisation or local organiser.

The overall choice of didactical solution does have some specific consequences for the design and operation of some aspects of the teaching-learning system. For instance, the NKI Internet courses generally put great emphasis on individual studies and individual work on exercises and assignments for electronic submission to a tutor for comments, evaluation and feed-back. Although it has been a main objective from the very beginning to exploit the possibilities for learning support from the learning group through interaction and discussion with fellow students, in most courses the majority of students have not taken the advantage of using the course Forums very actively.

Results from a number of evaluation studies have shown that individual flexibility is the most important and valued aspect for the majority of NKI online students (Rekkedal & Paulsen 1998, Rekkedal, 1998, Rekkedal 1999). This means that learning methods heavily based on co-operation and collaboration with fellow students in real time and/or paced and rigid progression schedules do not seem to be in line with the needs of the NKI distance learner.

On the other hand, learning theories based on social constructivism (see e.g. McConnell 2000) have dominated the ground, at least in Scandinavian academic institutions, and have had considerable influence on higher education institutions when embarking on distance education. It is not difficult to agree with the ideal of theories of learning as a social process where students help each other to develop understanding in an enjoyable and stimulating context and not only as an individual pursuit concerned with accumulating knowledge. The learning is process-driven and learners must be involved in the social process and pay attention to this process to achieve their desired goals. The outcomes are not only academic, but involve increased competence in working with others, self-understanding and self-confidence. Learning is seen as a construction of meaning in interaction with others (teacher and fellow students). Knowledge is constructed in social groups.

However, according to NKI research and evaluation studies we must acknowledge that for most distance learners the primary social arena for learning is often not the group of fellow students, but their local society and environment including family, friends and colleagues. Our main challenge may seem to find solutions in designing learning methods and support services stimulating individual learning and understanding constructed in interaction with the student's own social environment, colleagues, friends, family and others.

Student support in the NKI Online Distance Education System

The table below was presented by Rekkedal & Qvist-Eriksen (2003):

Time	Support needs	Component responsible	Tools/applications
Prospective phase	Information about courses	Administration	Print, WWW, print/broadcast media etc.
	Guidance concerning choice of courses and programmes	Administration	Phone, e-mail
	Financial questions, loans, grants	Administration	Print, phone, e-mail
	Guidance on practical matters	Administration	Print, phone, e-mail
Start-up phase	Dispatch of printed and other physical learning materials	Administration	Surface mail
	Registration/information/user identity, passwords etc.	Administration	e-mail
	Introduction to online learning techniques	Administration Faculty	Phone, e-mail Phone, e-mail
	Initial follow-up	Administration Faculty	Phone, e-mail Phone, e-mail
	Technical support	Administration	Phone, e-mail
Learning phase	Teaching/tutoring	Faculty	Phone, e-mail, Forum, WWW media
	Academic support	Faculty	Phone, e-mail, Forum
	Organisation of learning	Faculty	Phone, e-mail, Forum
	Social support	Faculty	Phone, e-mail, Forum
	Assessment	Faculty	Phone, e-mail, Forum
	Practical support, economy etc.	Administration	Phone, e-mail, Forum
	Follow-up	Administration	Phone, e-mail, surface mail
	Technical support	Administration	Phone, e-mail, Forum
	Resources/library	Administration	Print, WWW
	Learning group support	Fellow online students	Phone, e-mail, Forum
	Local learning support	Local faculty Classmates	Face-to-face
	Local administrative support	Local administration	Face-to-face, phone, print
Local technical support	Local faculty Local administration	Face-to-face	
Local social/practical support	Employer Family	Face-to-face	
Graduation	Diploma/accreditation	Administration	Print, face-to-face
After graduation	Counselling on further study	Administration	Print, e-mail, WWW
	Counselling on job opportunities	Administration	WWW, Forum
	Alumni services	Administration	e-mail, WWW, Forum

Figure 1. Framework of student support services for NKI online distance students

The support services for NKI e-learning students have been described in more detail by Sjaastad et al. (2003), where the 'Prospective' phase in the table above was described as 'Information/Guidance Phase'.

Research Methodology

Qualitative and quantitative survey

The evaluation study was based on a questionnaire developed in co-operation between the project partners according to a "grid of possible student support services during the different phases of an e-learning process". NKI decided that instead of distributing the questionnaire in the post or on the web, we would design the study as a structured telephone interview. This was both for time reasons and because we wished to get more comprehensive information as a basis for quality development of our

systems. Thus, we decided to construct a number of open-ended questions to get more substantial verbal responses. Consequently, we chose to collect both quantitative and qualitative data.

Collection of data

8 different interviewers with different functions, experiences and competencies concerning student support carried out the interviews. The interviewer group consisted of 4 people from the R & D Department, 3 from the Department for Student Support and Counselling, and 1 from the Marketing Department. Before starting the interviews all interviewers met for instruction and discussion to make the interviews as similar as possible. Before this preparation meeting the researchers responsible for the evaluation project revised the preliminary questionnaire based on a try out with 6 interviewees.

Selection of interviewees

We decided to interview a sample of students with recent experiences from the NKI Internet College and ordered a list of all active students and students who had completed an e-learning study programme during the last 6 months. 47 active and completed students who were reached by the 8 interviewers during a 3 hours period one afternoon were included in the sample. Only some very few students claimed to be too busy to be interviewed at that particular time when they were reached on the phone. Only one student gave a negative impression and refused to be interviewed, also with reference to difficulties with time available.

Data processing and interpreting answers

The student answers both on the quantitative and qualitative part of the interview were recorded on individual questionnaire word document forms during the interviews. The quantitative data was processed by the FOSS (File Oriented Statistical System) programme package (Amundsen 2001). The researchers have interpreted the open answers written by the interviewers during writing of the report.

Results – need for and satisfaction with student support services

Information phase

The quantitative questionnaire contained questions on the need for and satisfaction with support elements such as information about course availability as e-learning, about the total programme and individual courses, pricing, financial questions such as payment schemes, loans and grants, technical questions, possibilities of contact with student advisors, web information with FAQ pages etc.

The structured interview covered the same areas on how the students had experienced the information and their contact with NKI advisors. I was very clear that thorough information on all aspects of the e-learning programme before enrolling is seen as *'important'* or *'very important'*. Generally, the students were also very satisfied with the information they had received. Both the quantitative and qualitative part of the interview showed that the possibility for direct personal contact with advisors is considered to be important, and the students were also generally very satisfied with this support element, e. g.: *"Very satisfied, the advisor was very nice on the telephone, and I received the help and everything I needed"* or *"I was in contact and got answer from people that knew their job"*.

Registration phase/Start-up phase

The questionnaire and interview on the start-up phase contained questions concerning *real time technical support services, registration issues, and online learning techniques*. Research has shown that the first phase of studies can be critical for study success or drop out from distance study (see e.g. Rekkedal 1972). There is reason to believe that a similar relationship is present in e-learning.

NKI has put large emphasis on *technical support services* by e-mail and telephone and on systematic follow-up of newly enrolled students. In this study a large majority found technical support to be important, but, in fact, quite few said that these services were *'very important'*. Most of the students

had not actually needed technical support. Those, who had used the support service, were generally satisfied. Concerning *online learning techniques* it seems that the students fall into two separate groups, either they find this support element to be really important or not to be important. Very few are indifferent to this question. NKI has for many years offered an introductory course in study techniques to students taking lower level courses. It seemed clearly that respondents with low-level previous education and little experience from independent study would have liked to get more support concerning learning techniques: *“I missed some information about study techniques. That was lacking”*. On an open question on whether the start of studies functioned satisfactory, the majority answered positively. However, some had experienced problems. Especially, it seems to be frustrating if something is lacking in the package of learning materials at the start: *“Some books were delayed. I lost some motivation as it took some weeks to get all the learning materials”*. Some students also miss a closer follow-up scheme in the start-up phase: *“Some more deadlines and follow-up in the starting phase would have been good, so that one does get started. It is too easy to postpone the first necessary efforts”*.

Learning phase

The support elements covered concerning the learning phase was *access to and support from student advisors, tutor access in general, the possibility of contacting tutors on phone and e-mail, feedback on assignments, possibility to communicate with other students on e-mail and phone and discussion forums*. This study confirms previous NKI research that easy access to the tutor and quick feedback on assignments are *‘very important’*, while interaction with students is seen as less important by many. The students seem to be very pleased with support and help from their personal student advisor at NKI during their studies. Very few students find communication with fellow students as *‘very important’* for their learning. The students seem to be *‘satisfied’* and to a large degree *‘very satisfied’* with the services they have said to be most important, i.e. *communication with their tutor(s) and speed and quality of feedback on assignments*. It should be noted, however, that a large group of students who have experience with more than one tutor, report large differences, and often they have been dissatisfied with at least one of their tutors. It also seems that the tutors, who receive low ratings, supply low quality substance in their feedback, and they are also slower in returning assignments. There is certainly a challenge of following up tutors better to assure an evenly high and more predictable standard of tutor work. And – although communication with fellow students are rated as being less important, there is need for developments that make the course discussion forums function better than they do today for students who wish to take advantage of communication, discussion and collaboration with fellow students.

Summary and conclusions

The overall impression from both the quantitative and qualitative part of the evaluation survey on support services in e-learning at NKI was that the students find all the support services supplied as important or very important. It also seems that they are most satisfied with the services that they find most important. Generally, the students express a large degree of satisfaction with the support services experienced from the prospective phase until graduation. In fact, these are typical answers to the final question on overall opinion on support services:

“I am very satisfied. I am impressed by the totality of services. I thought Internet based learning was complicated until I started my studies at NKI.”

“All in all I am satisfied. According to my experiences I could take another course – and recommend it to others.”

“I am satisfied. One can always take contact with the tutor and receive good answers. Specifically the tutor is to great help.”

“I am very satisfied. I have received good information, and I know that there are people there who answer when I need it.”

“I have absolutely been satisfied – I will gladly return to other courses if I decide to continue to study.”

The survey ends with the following recommendations:

Support services offered to the NKI e-learners today are generally seen as important and satisfactory by the students – thus, the developments should continue according to the same philosophy of serving the individual learner and his/her need for flexibility.

Priory should be given to:

- Close follow up and support during the start-up phase concerning how to get started and how to make personal progression plans.
- Introduction to efficient techniques for online learning, specifically for students with little experience from independent learning.
- Follow-up and guidance of tutors who do not satisfy requirements concerning turn-around time and quality of comments/feedback to students.
- Developing course forums to function better for students who want more interaction with fellow students, without requiring too much participation for students who prefer more individual studies.

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Authors:

Professor Torstein Rekkedal
NKI Distance Education
Box 111, 1319 Bekkestua
torstein.rekkedal@nki.no

Svein Qvist-Eriksen, Director Student Support
NKI Distance Education
Box 111, 1319 Bekkestua
svein.qvist-eriksen@nki.no

SUPPORTING LEARNERS IN AN INTERNATIONAL ONLINE LEARNING COMMUNITY: ON THE ROLE OF FORMATIVE ASSESSMENT

Brian Hudson, Sheffield Hallam University

Introduction

The background context for this paper is the development of the international MSc *e-Learning Multimedia and Consultancy* that arose from the TRIPLE M Advanced Curriculum Development (CDA) Project supported by the European Commission under the SOCRATES programme (1998-2001). Outcomes from the associated ongoing research are reported in [1] [2] [3] and [4]. The programme involves an active partnership between Hogeschool van Arnhem en Nijmegen in the Netherlands and Sheffield Hallam University in the UK since recruiting the first cohort on September 2000. There are currently over sixty students enrolled across four cohorts. The programme as a whole is framed within a virtual learning environment (VLE) and involves a “blended approach” through international studies, local studies and independent study. Students work in international groups using the VLE, video-conferencing, email and synchronous discussions. The local studies involve face to face meetings in national groups at local study centres supplemented by video conferencing. In the case of the small number of students working at a distance from the local study centres, alternative means of communication have been established and supplemented by one to one communication via email, video conferencing and telephone.

Aims of the study

The aims of our research have been gradually refined over the course of the development of the programme since the first pilot phase in the second semester of 1999-2000 [5]. The evaluation of early modules on the programme highlighted the wish from the students for greater international collaboration. This was expressed by one student in particular who argued that collaboration in any environment is about needing each other and with reference to Salomon [6] drew attention to the fact that collaborative learning requires much and well orchestrated interdependence. In reflecting upon our experience we are confronted with the reality that promoting collaboration is both complex and challenging. Accordingly our major aims are to explore the aspects that characterise effective pedagogical practice and student engagement in open and flexible e-learning environments. This point of departure, combined with the outcomes of earlier phases of development, has given rise to several research questions including the following:

- 1) How best can we facilitate purposeful engagement of autonomous and independent learners in e-learning environments?
- 2) To what extent is the notion of assessment *for* learning a key condition for achieving *orchestrated interdependence* and autonomy in e-learning?

This paper focuses on some aspects of what we have learned to date about the role of formative peer and tutor assessment in an international learning community with reference to a specific module from the programme. Furthermore it draws on a more recent development that aims to support formative self assessment through a process of personal and professional development planning (PPDP). In doing so the following is taken as an appropriate description of the term “formative assessment”:

“all those activities undertaken by teachers and by their students [that] provide information to be used as feedback to modify the teaching and learning activities in which they are engaged” (p. 7) [7]

Research Methodology

The overall approach towards this enquiry is set within an ongoing action research framework [1]. We have adopted a "critical" action research approach [8] which takes a strong stance on action research as a critical social science, rather than simply as some form of practical reasoning, seeing it as connected to social action and social movement. In relation to the process of the development of the use of information and communications technologies (ICTs) in education, we describe ourselves as adopting the perspective of "socially constructed technology" [9]. We advocate that the social shaping of technology is governed by the ways in which users give their own meanings to ICTs and through the adaptation of such products and services to users' own purposes. Starting points for this research have been the standard approach towards module evaluation through such means as end of module questionnaires to both staff and students. In addition we have adopted an ethnographic approach with the aim of exploring emergent issues as they arise naturally through the process of enquiry. In relation to this aspect we have found the approach of responsive evaluation [10] to be particularly relevant. This approach aims to be responsive to the concerns and issues of the "stakeholders" involved in the evaluation. The context in which this research has been undertaken is one based upon a collaborative approach to teaching, evaluation and action planning within the programme team. Several of these cycles have led to wider dissemination of the outcomes as indicated earlier.

Programme Design and Pedagogical Approach

In designing and planning the programme considerable emphasis has been placed on enabling collaborative activity in multinational teams. In relation to this aspect we share the general perspective offered and the crucial distinction between co-operation and collaboration [11]. Co-operative work is seen to be accomplished by the division of labour among participants, whereas collaboration involves the mutual engagement of participants in a co-ordinated effort to solve the problem together. We have also been influenced by the thinking around the notion of "powerful learning environments" [12] [13] [14] which imply the creation of learning situations that elicit active and constructive processes of knowledge and skill acquisition and ample opportunity for interaction, communication and co-operation. Accordingly a project and team based approach towards learning underpins each module of the programme and we have given emphasis to the need for well-defined group tasks [15]. For the potential added value of collaborative learning to be achieved it is expected to involve challenging and intensive interaction between participants. Accordingly for the tutor, the issue of "group or network management" [16] becomes predominant.

Specific context for the study

The specific context for the study was the *Research Methodologies in Education and Training (RM)* module which involved fourteen students working together during the second semester of 2002-03. They were based at two local study centres in Nijmegen and Sheffield, together with two students based in Brussels, one in Linz, Austria and another in Kimberley, South Africa. The students' professional roles include those in the UK of a secondary county ICT consultant, a primary school teacher, two police officers involved in training and development and a multimedia developer in higher education. The Nijmegen group comprised a lecturer in Higher Education, a technical writer, quality control engineer in the ICT field, ICT consultant, education consultant and a marketing manager of a regional newspaper. The group studying at a distance comprised a provincial Education Department Adviser for ICT in South Africa, two operations managers from the European School Net in Brussels and a lower secondary school (Hauptschule) teacher from Linz, Austria.

The RM module aims to promote a critical understanding of various paradigms and methodologies in the conduct of educational research, in preparation for undertaking independent research for the dissertation.

The teaching-studying-learning experience is structured around three strands which run through the entire module, all of which contribute to the summative assessment of the module as a whole. These

are (i) active participation through discussion and collaboration; (ii) the critical analysis of a published refereed journal article leading to Assignment 1: A Critical Analysis and (iii) the process of research planning leading to Assignment 2: A Research Proposal. Each strand is an essential element of the whole. The aims of the active participation component include setting the context and content of educational research and also providing the scaffolding [17] and support for the ongoing development of the other two components.

The module started at the end of January 2003 and spanned 18 weeks of which at least two weeks were holiday weeks in both centres. The online communication, interaction and collaboration was scaffolded via the design of a number of activities which consisted of (i) discussion fora in response to set reading tasks; (ii) discussion topics in response to reflections on prior experience and (iii) group activities. The Discussion Topics included responses to the questions “What is educational research?”, “What makes a significant research question?”, “Qualitative or quantitative methods – does it matter?” and a response to a photograph in relation to data analysis and interpretation. These aspects were interspersed with discussions based on set readings which included Chapter 1 of Cohen et al [18] on the “Nature of enquiry” and also chapter 3 on “Research design issues: planning research”. In addition there were two Group Activities. The first group activity involved the critical analysis of a research paper that was conducted in an international group. The second group activity involved the design, trialling and evaluation of a data collection instrument/technique(s) also in international groups. In addition to the students were asked to provide peer formative assessment on drafts of both assignments at set times within the module schedule.

Methods of data collection on Research Methodologies module

Data was collected from a variety of sources which comprised an end of module student questionnaire that was completed online by 11 of the 14 students; an end of module staff questionnaire; an end of module focus group discussion via video conference between Sheffield and Nijmegen; an end of module group discussion between tutors with external examiners via video conference between Nijmegen and Sheffield; an end of module group discussion with student representatives, tutors and module leaders in Nijmegen; the module statistics collected automatically in the virtual learning environment and the dialogue contained in the various discussion fora, with the prior consent of the participating students following a request and associated statement of research ethics. In addition outcomes of the initial process of data analysis and interpretation were provided to the students for their comments, feedback and validation by submitting a full draft of the first version of the associated paper [1] to the virtual learning environment prior to final publication.

Data analysis and interpretation from Research Methodologies module

The overall statistics collected by the virtual learning environment give a broad indication of the degree of online communication and interaction with the learning environment by recording the total number of “accesses” by participants. This amounted to over 71500 during the period of the module and represented over 2.6 times as many accesses as the previous module, on which the sense of community had not been very strong. In fact a small number of students had been unable to maintain progress at the anticipated rate due to sudden and unexpected changes in work patterns.

In response to the questionnaire all the students responding agreed that they felt as if they belonged to a learning community, that the atmosphere of the learning community promoted their learning and that they had enough support for the studying process. Also all these students felt that they had succeeded in the module. This sense of community was one that was shared by the tutor team. A small number of students did not feel the benefit of peer support or the international dimension. Nevertheless all the students agreed that the module content met their personal learning goals and that the module activities were challenging and motivating. All the students thought that the Reading Tasks and Discussion Topics promoted their learning and all except one student agreed that the Group Activities did so. A variety of aspects were emphasised in the open responses to the question of what most promoted student learning. The most cited aspects were the assessment items and the discussions in

the local meetings (over half the students referred to these aspects). The other most cited aspects were to online group work, reading tasks and online discussions. Examples of specific responses to what the tutors did to promote students' included: "the structure of the unit was well thought out", "well-planned activities, discussions, and assignments"; "the role of the tutors in giving feedback on drafts" and "providing motivating feedback".

With regard to the question concerning the facilitation of purposeful engagement of autonomous and independent learners in e-learning environments, the use of a variety of strategies was a key success factor. These strategies involved discussion fora in response to set reading tasks, discussion topics in response to reflections on prior experience, group activities and peer formative assessment on drafts of assignments worked effectively in promoting purposeful engagement, autonomy and independence. The overall structuring of the various tasks, assessment requirements and orchestrated feedback all were also key factors in the process of facilitating purposeful engagement. In addition the local meetings played an important role and were cited by more than half of the students, through the open responses at the end of the module, as one of the most important aspects in promoting their learning. These meetings gave the opportunities to provide the students with general overviews and enabled them to consolidate their detailed understandings. The first reading task on the Nature of Enquiry contained much that was entirely new to the students and many new ideas and terminology that were difficult to grasp. This also created difficulty for online discussion. The local meetings also provided opportunities to support the students emotionally e.g. in providing reassurance in addition to additional explanation and opportunities to discuss some of the underlying ideas.

With regard to the question concerning the role of formative assessment, it can also be said that the use of a variety of strategies involving discussion fora in response to set reading tasks, discussion topics in response to reflections on prior experience, group activities and peer formative assessment on drafts of assignments worked effectively also to promote a high level of interdependence within the learning community. This conclusion can be drawn from the evidence of the high levels of interaction, communication and collaboration in the discussion fora. It is also supported by responses to the questionnaire which indicated that all the students agreed that they felt as if they belonged to a learning community, that the atmosphere of the learning community promoted their learning and that they had enough support for the studying process. Furthermore the responses to the question about which activities promoted learning confirmed the importance of assessment in this module because of the way in which the role of the assignments was stressed by the students. What all the responses illustrated is that the tutor team was able to engage most students in this e-learning environment as a result of the complex interaction of (i) structure of the module as a whole (e.g. reading tasks, group tasks, local sessions, discussions on line and processes of peer feedback), (ii) the content of the tasks and assignments and also (iii) the processes of tutor feedback to the students.

Personal and Professional Development Planning (PPDP) process

A major focus of our attention in the early stages of development of this project has been on the promotion of formative peer assessment as a means of supporting learners in online learning communities. However as a result of student and tutor feedback, a framework for facilitating the process of formative self assessment has become the priority of our current development. This is based on the introduction of a PPDP process across the programme as a whole via a VLE "organisation" area in order to support formative self assessment through the process of systematic reflection, evaluation and action planning. This has also become the focus of attention in terms of our ongoing action research during 2003-04. Whilst a full evaluation has not yet taken place, two students currently at the final dissertation stage who have engaged in the process offer particular illumination of their experience on the Research Methodologies module. The first student, Michael, completed the module in the previous year and in his evaluation of his experience commented that this had been the "most difficult" module to study and offered the following observations:

I think this unit has been a huge confidence boost. It has given me the ability to think far more about approaching a variety of educational matters with wider ranging influences. Possibly this is based on

the development of my own educational theory, related issues and practice and being able to talk the language.

The second student, Marcus, was a member of the most recent cohort who offered the following response:

I strongly feel that two aspects are responsible for the new insights I got within this module. The first one is the way this course was delivered – as an online course. The combination of literature study, guided by input from my tutor, with regular online discussions with fellow students, offering new and frequently challenging views of the topic under observation, really stimulated my own learning, leading to a deeper level of understanding. This stands in stark contrast to my previous academic experience, where the learning process mostly used to be a one-way communication from the tutor to the students. Obviously this deeper level of learning comes at a price, which is the time requirement. This is leading indirectly to the second aspect accounting for the very positive experience I had in this first module – the intrinsic motivation for this programme. My personal motivation was not only boosted by having a clear idea why I wanted to participate in this programme, but also by having a clear understanding why this specific module is an absolutely essential requirement on the way to the dissertation.

Conclusion

To conclude, the development of this programme as a whole has been part of a project with the aim of “transformational change” in terms of didactical and pedagogical practices. The particular module was adapted from an existing version that involved more traditional and conventional approaches. As such the aim of successful “transformational change” was achieved with this module and the teaching-studying-learning experience was undoubtedly enhanced. Whilst the “blended” nature of the experience as a whole was a distinctive aspect of this module it can be claimed that this approach was also fundamental to success in achieving a mutually supportive learning community. Furthermore the role of formative assessment in this process can be seen to have been a key factor.

The Research Methodologies module was first offered in 2001-02 by the same team with only minor changes being made for 2002-03. On this first occasion, we were less successful in engendering a sense of community and have attributed this largely to the difficulty of developing a critical mass with less than ten students. As the cohorts begin to merge and the numbers build in the Dissertation module, a key challenge from 2004 will be to establish a mutually supportive online community at a stage that traditionally has been rather isolated and lonely experience for many students. The task of the tutor team will no doubt remain complex and challenging in new and unexpected ways.

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Author:

Prof. Dr. Brian Hudson
Sheffield Hallam University, School of Education
College House, Collegiate Campus, Sheffield, S10 2BP
B.G.Hudson@shu.ac.uk

PROBLEMS OF DISTANCE PROGRESS TESTING

Natalia Miloslavskaya & Alexander Tolstoy, Moscow Engineering Physics Institute

1. Introduction

New educational technologies based on multimedia computer systems and tools are widely used in many educational programs of various educational institutions from primary schools to universities and qualification improvement courses. Their efficiency has already been proven in teaching foreign languages, physical processes and phenomena simulation, and also as help-systems with a large amount of stored information. Many educational institutions create their own educational and methodological support for the disciplines and courses taught and develop various conceptual approaches implementing their original statements when applying different forms of distance learning in the educational process. For example, usage of online electronic textbooks (ETs) on the subject basics can become a first step towards this end. Students of various specialities can effectively use these in their independent work on the course or for the purpose of self-education and reading for examinations for the extensive correspondence study. On the one hand the ET allows a preview and familiarization with the content of future lectures to be read by the teacher. On the other hand it also gives students an integrated view of all the content of their future educational process. In the latter case the student studies a course independently and his/her progress testing is implemented either by a common method of discussion – during a face-to-face meeting with a lecturer - or by the automated progress testing system.

2. Designing online progress testing system

The main purposes of the automated student testing are to test comprehension of the theoretical material studied and test a student's ability to apply the newly acquired knowledge and skills for making his/her own decisions and implement them as completed products (such as software and hardware solutions) and work out concepts, strategies, techniques etc.

The online progress testing system (OPTS) is an integral part of the distance learning software intended for scheduled testing and quizzes with the subsequent automatic or hand check or self-check with progress reports either in the printed form or as a separate file. Taking into consideration the trends in developing educational programs in Russia and abroad, the fast pace of computing tools and telecommunications development, and extension of activities of primary and higher school teachers, we witness today the necessity of creating and implementing new versions of the software. It is intended to generate tests using modern multimedia technologies with friendly interfaces, for unifying test storage structures and permitting interpretation of the test results.

The OPTS structure is shown in Fig.1. All the key elements (the test and report generators and answer analyzer) are framed in bold boxes. Five special databases (questions and tasks, correct answers, testing results, report forms, recommendations) should also be supported in the OPTS. They should be updated and modified depending on the changes of the theoretical lecture material. The system-student interface, which guides testing processes and contains some instruction on the OPTS usage, is mandatory. The component for analyzing and gathering the testing result statistics is optional but advisable for making subsequent decisions about the ET advancing, depending on the discovered simplicity or complexity of the topics under study.

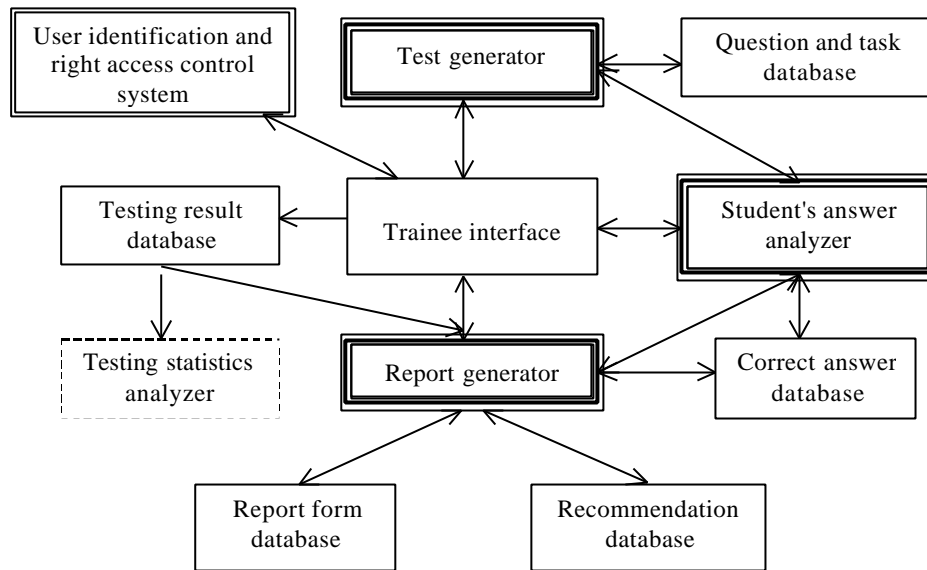


Fig.1. The OPTS structure

One of the main components of the OPTS is the system of the user identification and access rights control. All the users can conventionally be subdivided into "trainees" and "teachers". A trainee only reads the ET, passes tests, stores and prints out the test results. A teacher (instructor, tutor or another member of the staff) has the right to update the contents of four databases, except for test result database. No user, even the teacher can modify its content. The user registration can be executed traditionally by the user's name and password. Such a situation as password cracking must be eliminated in the OPTS, otherwise it would be possible to gain all the rights for data editing in the databases of tests and change the answers by logging into the system with the teacher's password.

One of three main OPTS gears composing its core is the gear for the test generation from a set of admissible questions or tasks. A test is a combination of interdependent or independent tasks of equal or different complexity, assigned "from simple to complicated" and allows adequately defining knowledge and other trainee characteristics important for the teacher. For example, there are a student's correctness in answer, response time, ability to make his/her own conclusions about the material studied. In order to eliminate copying results among the trainees the tests should be given to the students in different sequences with different orders of answers, from which to select a correct answer is necessary. A test complexity should correspond to a student's preliminary knowledge evaluated before his/her work with the ET.

The testing part of the OPTS with a flexible user interface allows the system to conduct the student testing in groups of questions and tasks equal to the number of the chapters in the ET, vary the conditions of testing such as response time, ratio of tasks of different types, demonstration of a correct answer, etc, and save these parameters in the system configuration files. Progress testing in the OPTS is done by demonstrating a specially generated sequence of tests, analyzing a student's answers and the final estimating of progress success with recommendations as to further work in the educational course on a PC monitor (Fig.2.). The analysis of the test answer correctness is implemented on the basis of comparison with a correct answer database. The response time to each question or task and assurance in the answer, which can be tested by asking a student to confirm his/her answer and repeated computing response time, should be fixed. The testing results are identified by the student's surname and are saved in the testing result database as a separate record.

The analyzing part of the OPTS enables one to derive tasks according to testing results. This makes it possible to compile the repeated test from either the questions and tasks corresponding to the topic where the student has given incorrect answers or in the case of a low summary mark. For the second test all the questions and tasks are generated in a different order that generates a modified test.

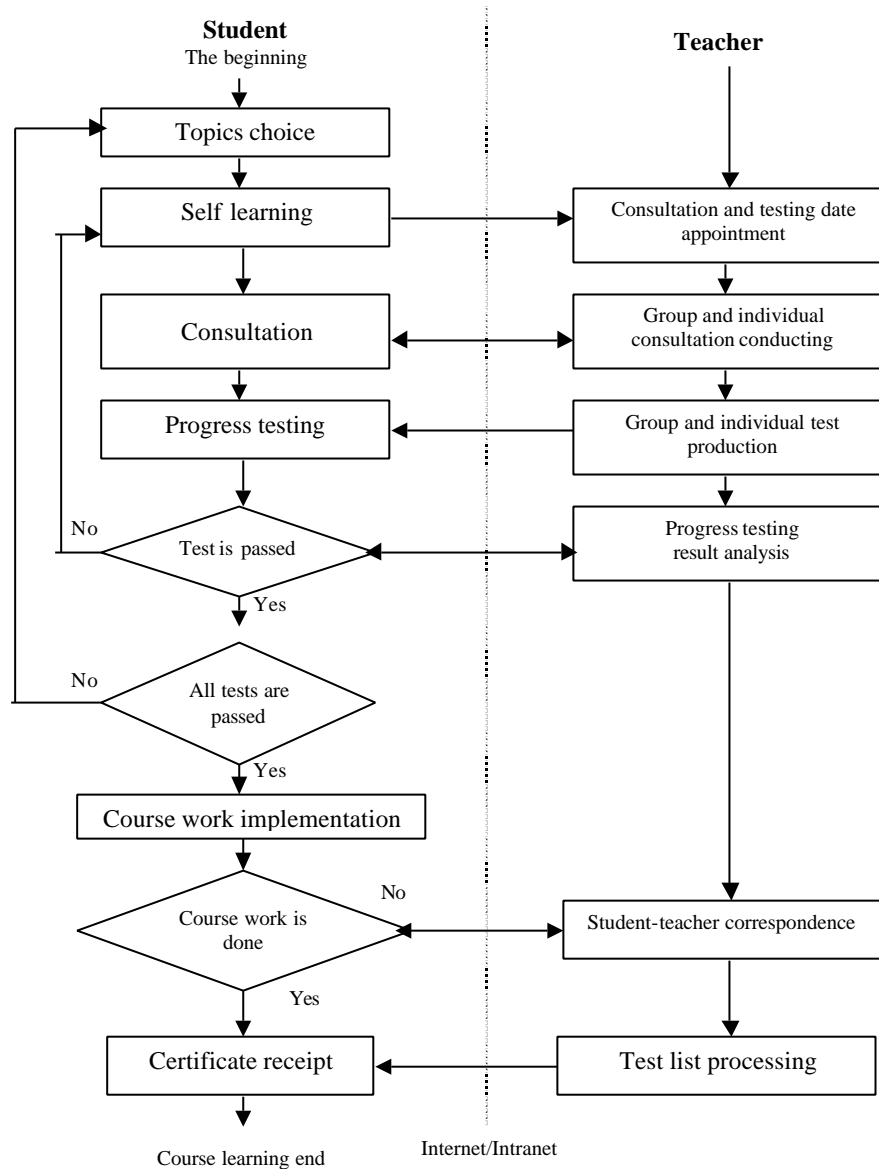


Fig.2. The course distance learning scheme

The degree of the result checking automation depends on the test requirements of the educational course teacher in each particular case.

The report generator should enable a student to select a report with a different detail of testing results from the stipulated set. The report can be printed out or saved on any carrier (for example on a diskette) as a file protected from modification and should be necessarily supported by the recommendations for a further student's work on the ET.

The OPTS should allow the system to

- statistically process the results of the student's progress testing, including, for example, relative complexity of a test determined by the teacher in some quantitative equivalent,
- register the response time the student spent on completing the test,
- address the tests to a single student or a group of students or all the students of the some year,
- make reports about the check results bunched to different tags.

The most important outcome of testing by the OPTS is an opportunity of qualimetric student's personal estimation according to his/her testing results. This analysis is based on different types of

questions and tasks allowing to measure not only the level of knowledge in the discipline but also indirectly evaluate the student's visual memory, an ability to think and to analyze, concentration and other characteristics of the human brain. A subsequent distribution of students into specialized groups according to specifics of their memory and thinking allows the teacher not only to quantitatively evaluate the level of knowledge but also to take into consideration their personal psychological characteristics in a learning process. Besides, such information can be of great importance during assigning the students to various departments with different specializations after graduating from the educational institution and make a correct choice of organizations advisable for work (more theoretical or more practical profile). Some students can be offered to continue his/her research and to extend education with the aim of getting PhD or another degree. In addition the teacher, together with the faculty dean, can compare the efficiency of different educational methods according to the changes of qualimetric factors and where it is necessary to correct them and focus on developing different types of memory, attention, thinking, practical skills, etc.

The best and most effective approach is the OPTS functioning within the unified framework of an educational institution distance learning system with such features as

- the system operation integrated into the framework with a friendly interface and document circulation,
- the support of remote access to the ET through the global Internet with usage of environment built-in capabilities for converting text documents into HTML-format,
- the high reliability support due to multi-level system of access control,
- the provision of student's friendly interface with hypertext links, external applications run, etc.,
- the usage of various types of text and graphic formats,
- the support of teacher-student interaction (for example, with the help of e-mail messages, Web-forums, chats),
- the effective support of continuous updating of all databases,
- the implementation of statistical result processing with output in the form of reports in any format the teacher desires.

3. Problems of practical OPTS implementation

The online ET requires either a personal student activity with the ET on a separate PC or an access through a network (e.g. department, faculty, university network or global Internet network). There are two different approaches for the dissemination of the ET and online progress testing including an independent teaching carrier (for example, CD-ROM) with a tutorial recorded on it, and as a separate unit on a network file-server.

The file containing the test results is recorded in a specially created and maintained database in the faculty network. It is also possible to create such a file on a student's diskette, which he/she can show to the teacher. Then the teacher makes a decision about the success or a failure of the student in the tests on a certain part of the educational course. The testing results can be simply printed out. In the two latter cases the confidence in the information handed in from the student to the teacher may be doubtful, hence there arises the problem of testing result protection from modification and substitution (we shall return to this problem later).

The following functions and types of tests can be created from the ET for a simple check for comprehension of material:

- selection from a set or multiple selection (a test guesses selection of a correct answer from a number of proposed answers; only one of them must be correct and the rest should not allow "free" explanations),
- conformity (necessary to confirm or deny the answer to a given question),
- logical chain (a student must place figures, definitions or features describing stages of the process, structure transformations or events in the logical sequence),

- term (necessary to write the title of the structure shown in the figure or some definition),
- object selection (necessary to match one of pictures to the given definition),
- situational task (on completion of the familiarization with the descriptive part of a task as the text in the HTML-format with graphics, sound or video, the student receives a combination of tasks of all the mentioned types),
- symbol sequence input (necessary to write command, code, text...).

The tests can be available directly during the work session via the program-browser or read from the text files with a special syntax.

The questions and tasks can be grouped forming something like a problem bank and then integrated into tests, which provides a good opportunity to vary the arbitrary combinations of questions and tasks in different tests. The tests can be

- automatically and randomly formed from the questions and tasks previously created to ensure extra objectivity,
- formed from certain problems chosen from the previously created problem bank,
- created anew without any reference to the problem bank.

The main emphasis in designing the editorial part of the test generator should be on maximum simplification of the test with all the capabilities and advantages of a modern multimedia systems.

The ET described above can be regarded a "simple" tutorial. The students are tested for their ability to apply theory to practice, and they should know how to use the commands, write programs or separate modules, make analytical reports, state and describe concepts and work out techniques choosing appropriate mathematical knowledge. Validation of correctness of their answers requires artificial intelligence methods and approaches [1]. In this case the ET can be called a "practical" tutorial.

To have a detailed picture of each student's knowledge it is desirable that tests are created for all the structural units of the course, chapters and paragraphs, and for the course as a whole.

The student's knowledge evaluation can be made either in the form of "correct/wrong" or by percentage, in the standard and n-mark systems (for example, 5 or 11). The time the student spent on the answer is considered a relevant factor when making conclusions about his/her understanding of theory. If a student does not give answers during the given period of time, the system recognises a test as is left unanswered. In the OPTS it is possible to make additional attempts to answer the tests, if the first attempt was a failure. But the total number should be limited.

The student's results are stored in the special database in the form of files protected from modification. The correct answers and typical errors are also recorded to this database. Thus it is possible to gather statistics on the degree and complexity of the students' understanding of definite sections of the course. In future this information could be taken into account during the course improvement - it can be simplified or on the contrary made more complicated.

After passing the tests the student or the teacher can print out more in-depth or summary reports selected from a set of available forms. The student can also receive a confirmation of a successful pass of the tests or get recommendations to return back to certain chapters and paragraphs for a unit of study.

Standard service functions for changing basic theoretical material in the ET for updating of the OPTS contents and all its components should be implemented, namely:

- access registration,
- user rights control,
- import/export/modification of databases (questions and tasks, reports forms, recommendations and correct answers),

- protection against unauthorized access to databases, modification of data stored within them, copying of tests/databases of questions and tasks; adding/deleting/renaming of databases, protection against unauthorized modification of testing results and so on.

Special functions such as performing statistics of answers to different types of tasks in database, printing out on paper either separate screen form or the test conclusion and final recommendations or previewing (testing in edit mode) may also be performed in the OPTS.

4. OPTS example

"Intranet Information Security Maintenance" and "Information Security Basics" educational courses have been realized with the described OPTS at the Moscow Engineering Physics Institute (State University) within the Information Security Faculty. They were successfully tested by the students of advanced courses, post-graduate students and students in qualification improvement courses.

In 2002 the Intranet Security ET [2, 3] with tests automatically generated from more than 700 questions has appeared. The educational course is taught as a basic course for speciality in "Complex maintenance of automated system information security". The necessity of preparing such a course was caused by a widespread growth of the Intranet technologies. In the search for a compromise between the enormous material and the quality of its demonstration, visualization and line mining speed, an idea of applying the widespread Web interface in an educational process has arisen. The textbook is implemented as an interactive Web site with text and graphics and hypertext links to Web-sites in the Internet, and may be used by those familiar with any standard Web browser. It includes the theoretical material on the subject, together with the problem book and can be used as a reference book and as an electronic representation of the material, making referencing and analysis of the information easier. It is implemented in two versions, one for open access via the global computer network and one for use in classes (for a local area network) applied in the educational process of the university. The product has a modern design and incorporates features to meet the modern requirements of computer learning tools though it is used only as addition to the traditional lectures. Its OPTS contains tests for student's self-testing such as "multiple selection", "conformity", "term" and "object selection". The originally developed module for the student's testing in the local area network is currently being perfected.

5. Conclusion

Further improvements to the OPTS are still to be done, including adaptation of progress testing to the level of complexity of the educational courses. This will ensure a personalized approach to every distant learning student and thus increase the learning efficiency. In addition, an active usage of artificial intelligence systems is sure to enrich the educational process of many educational institutions by practical tutorials.

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Authors

Miloslavskaya Natalya, Associate Professor, Subdean
Tolstoy Alexander, Associate Professor, Subdean
Moscow Engineering Physics Institute (State University), Information Security Faculty,
Information Security of Banking Systems Department
31 Kashirskoye shosse, Moscow, Russia, 115409
milmur@mephi.edu
ait@mephi.edu

DIRECTING ASSESSMENT AT SUPPORTING LEARNING

Som Naidu, The University of Melbourne

Abstract

This paper describes an attempt to use assessment activities in a course to support student learning and improve the quality of the students' learning experience. It aims to show that assessment activities can be more than devices for merely measuring the achievement of learning outcomes. Innovative use of assessment tasks can serve to scaffold learning and indeed enrich the quality of the student learning experience. Assessment activities that are able to lead to such outcomes mirror the sorts of activities that students are likely to be doing while in professional practice. As such, they provide students with training that they will need for professional practice. This paper seeks to illustrate how some of these types of goals are being pursued in a graduate level course that is offered exclusively in an online distance education format.

On supporting student learning

A great deal of work has gone on in supporting student learning in open and flexible educational settings in various ways, and with various technologies (see for example, Bates, 1990, Collis, 1996, and Khan, 1997). These authors survey several technologies including print, radio, audiocassettes, telephone, computer-based applications such as electronic databases and CD-ROMs, computer-mediated communication technologies (i.e., e-mail, computer conferencing, bulletin boards, audio and video conferencing, broadcast television, and the Internet. Many of these technologies are ideal vehicles for content delivery and supporting communication, but in themselves, they are lacking in the capability to support or "scaffold" student learning activity.

A "learning scaffold" is best described as a "transitional support strategy" which is put in place to guide student learning in desirable directions, or to enable the development of desirable cognitive skills in students. The expectation is that when this learning scaffold is removed from the context, the targeted skills become part of a learner's repertoire of learning skills. Parents or human teachers are excellent examples of learning scaffolds. Among other things of course, they are there to provide advice and support when these are most needed. At some point in the child's cognitive development these types of support are progressively removed and as such are no longer accessible or accessible to them only in limited ways. Children go on to live and function in society independently of the support and advice previously provided by their parents and teachers.

Learners in open, distance and flexible learning environments who work independently with self-instructional study materials, need help with the organization and management of their learning, as well as the skills to critically reflect on information they may have gathered. While a great deal of work has gone on in supporting student learning in such settings with various forms of technology and local centre-based support, work is lagging in the area of cognitive supports for student learning in open, distance and flexible learning environments (see for instance McLoughlin, 2002).

Directing assessment at learning

Research in learning and cognitive sciences has shown that an effective way to teach new skills to learners is to put them in the kinds of situations in which they need to use those skills, and to provide mentors (i.e., expert practitioners) who are able to help learners as and when necessary (Schank, & Cleary, 1995). Through this engagement, learners come to understand when, why, and how they should use targeted skills on the job. They receive key lessons just-in-time, which is when they want

the information, when it will make the most sense to them, and in a way that they will be most likely to remember the information for later use when they need it in their work.

Schank and Cleary (1995) argue that the design of such a learning experience takes the form of a storyline in which students play a key role such as being a manager of an e-business or e-learning organization. These roles are carefully selected to reflect those that students of such a program might actually do in real life, or might need to know about because they might manage or collaborate with others who might be performing those roles. Students work in small groups in these scenarios with the help of detailed information about the simulated context, together with project details. Supporting materials and resources are also available, and online mentors are available to answer questions and point students in the right direction on a needs basis (Schank, 1990; 1997). This is the main point behind the story-centered curriculum (SCC) popularized by Roger Schank and his colleagues (Schank, Fano, Jona, & Bell, 1994).

The story in this instance is the simulated context in which the student plays a key role. The story in this curriculum serves as the essential scaffold. These researchers argue that stories have always been a part of human existence. Humans have always told stories, and the most powerful of all stories shape the way in which we relate to our world. Furthermore, we tend not to forget these life-changing stories. There is good reason then to make powerful stories the centre of educational practices. These stories must involve students as well as their peers, because that is how their work situation is most likely to be. A story-centered curriculum is goal-based, and the goals are those that the student has for entering school and following a curriculum in the first place. A story-centered curriculum is also activity-based. Students work through these activities to learn the critical skills they require in order to complete their mission and successfully accomplish their goals (Naidu, Oliver, & Koronios, 1999). This is what is at the heart of the concept of “learning-by-doing”. Learning designs such as these focus attention on improving the quality of the student learning experience. They ensure that the student learning experience is situated in authentic learning activities that reflect real life situations, that it is meaningful, and therefore inherently motivating for the student.

Goal of this paper

This paper argues that carefully designed assessment activities have tremendous potential to scaffold learning. It suggests that course designers need to move away from seeing assessment tasks as devices for knowledge acquisition, and start seeing them as instruments for supporting learning and improving the quality of the student’s learning experience. It goes on to articulate an attempt in this direction in an online distance education course (*OMDE607: Course Design for Open and Distance Learning*) in the Masters in Distance Education Program offered by the University of Maryland University College in collaboration with Carl von Ossietzky Universität Oldenburg, Germany.

Assessment activities in OMDE607

The course development project

In being a course about the design and development of online distance education courses, a core assessment task in this course is the development of an online course component. This does not have to be a whole course, but a segment, a lesson or a module of a course. Students are provided with the resources in order to be able to complete this task. However, the course is to be considered generic, and in principle, could be delivered using other media or other delivery environments. Students are required to defend all their learning and instructional design decisions, including utilization of media capabilities for presenting content, activating and supporting student engagement with that content, assessing learning outcomes and provision of feedback to learners. Their grade on this assignment will depend not only on what they create as part of this task, but also on their engagement with the work of their Study Group. Each study group member is expected to act as a student reviewer in the courses of their team members. The feedback they provide to their colleagues will also count towards their final assessment mark for this project.

The goal of this assessment task is to enable students to apply knowledge gained from the readings in this course and from interacting with peers. Particular attention is placed on creative and innovative integration of learning theory into the design of a course for open and distance learning. This task is aimed at developing the following skills in learners:

- Transfer of theoretical knowledge into practice.
- Translation of conceptual knowledge into creative and innovative design.
- Creative application of the unique attributes of information and communications technologies.

Website critique

Very early in this course, one of the first assessment activities that students are required to carry out is a critique of course websites of their choice. This assessment task requires them to search and analyze five course websites. They are required to focus their critique on all aspects of the design of selected courses including their pedagogy and technical attributes, as well as their look and feel. They are required to develop their own criteria for examining these course sites. The criteria that they develop would reflect their understanding of issues that are germane to learning and instructional design.

The goal of this assessment task is to enable students to undertake a systematic and critical analysis of selected online courses. It is designed to develop the following skills in learners:

- Demonstration of approach to the analysis of online course websites.
- Demonstration of understanding of learning and instructional design and its application to web-based course design.

Management report

Armed with a thorough grounding in sound principles of online course design and development, students are then required to produce a report reflecting their grasp of the management issues related to instructional design and the Course Development process.

To demonstrate competence in this kind of activity, students are asked to assume the role of an internal or external consultant to an organization of their choice. An internal consultant is an in-house expert who is often asked to provide a service to another department, or division of the organization. An external consultant is someone with the same sort of skill, but who is brought in from outside the organization to provide that kind of service. This organization is considering moving into online education and training. Its management has asked you to make a recommendation regarding the best way to organize and implement such a move.

Although a final report for this task can be quite comprehensive, for the purposes of this assignment, students are asked to focus their advice on the organization of their course development activities. They are required to write a memo to their Vice President with three organizational models of course development, outlining how the process will be staffed - who does what, what processes will be followed, where the process will be located within the organization, etc. They are required to make a recommendation as to the preferred model, offering arguments in support of their decision.

This assessment task is designed to enable students to undertake a significant piece of report writing that would reflect their understanding of the subject of instructional design and course development for open and distance learning. It is intended to achieve the development of the following skills:

- Development of skills in composition and presentation.
- Cultivation of skills in critical analysis and argumentation.

Critical reflection

In order to record their engagement with the foregoing assessment activities, students in this course are required to maintain a *Learning Journal*, which they turn in at the end of the term. This learning journal documents their plans and activities in relation to their website critique, management report, course development activity and their thinking on these tasks, what they learned from it, as well as their personal concerns and questions about it. In this journal, they are asked to pay particular attention to the learning opportunities that these assessment tasks presented to them, including what the tasks enabled them to learn about course design for open and distance learning settings.

The goal behind this requirement is to enable students to systematically capture their engagement with the course design and development activity and learning in this course. For the assessor, the learning journal permits an insight into students' approaches to the course development task, their thinking on the subject, what they learned from it, as well as their personal concerns and questions about it. The keeping of the learning log serves as a useful tool in the cultivation of skills in critical reflection in and on their own learning activities (Schon, 1987). It also reflects a student's ability to capture the less overt and less tangible aspects of their learning.

Data analysis and discussion

Twenty-four student *learning journals* (derived from the Fall 2002 cohort) were carefully studied in order to ascertain what the students thought they got out of the assessment tasks that they completed for this course. A great deal of interesting commentary was observed, which was not possible to reproduce in this paper. Instead a snapshot of the gist of the students' commentary is presented here. In this summary, we have tried to capture the spirit of this commentary under six categories that emerged from the journal commentary. As such, they summarize what the students thought they got out of the assessment tasks in this course. They also reflect very accurately the key emphases of the course itself. Each one of these categories is discussed briefly in the following.

Instructional systems design. The technology of the Instructional Systems Design (ISD) process is a core component of this course. It offers a systematic approach to the analysis, design, development, and evaluation of learning and teaching. In this course, it offers students the primary scaffold for studying about learning and instructional design processes. Students suggested that the assessment tasks in this course enabled them to get a good grip of the ISD process, including various models of the process as well as the power of the technology.

Setting and assigning goals and objectives. A key lesson of the ISD process is how to set clear and concise goals and objectives for any educational activity. This may seem like a simple process, but it is not. Educational practice is fraught with instances of poorly designed goals and learning objectives that are very hard to assess fully and fairly. The assessment tasks in this course were designed to give students plenty of practice in setting goals and objectives. Students in the course suggested that these activities enabled them to rethink contemporary practices in the setting of goals and objectives, and their importance to learning and the assessment of learning outcomes. They said that they also learned how to go about setting clear goals and objectives that are meaningful to learners, and which serve as scaffolds or road signs for learning.

Pedagogical models and learning theories. At the heart of instructional design lies an adherence to how human beings come to learn something. There are several theories about how humans do learn. The assessment activities in this course required students to examine these critically. They were also required to demonstrate their competence in the translation of their preferred theoretical perspectives into real learning and teaching activities. Students said that because of these assessment tasks, they were a lot better informed about pedagogical perspectives on learning, about the role of students and teachers in these contexts, and also the important role that pedagogy played in instructional design.

Assessing and measuring learning outcomes. Sound pedagogical design and carefully crafted learning outcomes can be meaningless to the students if the assessment strategies employed are not designed in ways to assess these learning outcomes fully and fairly. The development of suitable strategies for the

measurement of intended learning outcomes is very critical to good instructional design. Educational practice is littered with terrible examples of assessment practices. In this course, by the design of its own assessment activities, we tried to emphasize the importance of setting authentic assessment tasks. These tasks are designed to be congruent with the pedagogical perspectives of the course and reflect more accurately the kinds of activities that students are likely to be engaged in when they leave formal education. As such, authentic assessment tasks serve as a form of apprenticeship for novices. Students of this course seemed to think that the assessment activities in this course were able to achieve those goals. They said that as a result of these activities, they were better informed about various methods of assessing learning outcomes, and how to make assessment more authentic, more meaningful, and motivating for students.

Use of media and delivery methods. The selection of the tools and technologies for teaching and supporting learning are just as important considerations in the design of learning environments. The technology of instructional systems design suggests that this is often a matter of matching the choice of media with a whole range of variables including, the type of learners, nature of the subject matter, and the mode of the learning and teaching transaction. In this course, we were exploring opportunities for distance education and on-line learning. Students seemed to suggest that they were able to gain an understanding of a wide range of possibilities in this regard, and more importantly, the methods for selecting appropriate technologies for particular learning contexts.

Team approach to course development. Much of course development activity, and especially for distance education and on-line learning is a team effort. Therefore, practice within a team is one of the things that we have been trying to make more use of in this on-line Masters in Distance Education program. Students are required to work in small groups to negotiate a whole range of issues that are germane to course design and development. Students felt that this kind of activity gave them essential practice in critical tasks associated with project management such as, leadership, vision, stewardship, and communication skills.

Concluding remark

A major suggestion of this paper is that supporting student learning needs to be seen as a *proactive* process rather than a *reaction* to learning problems that are encountered by students. This is easily achieved by carefully designing assessment activities that require students to engage in meaningful, authentic and motivating learning activities. This is not to suggest that students' learning experiences ought to be choreographed to the extent that in doing so, one runs the risk of killing off creativity and independence on the part of learners. It suggests providing learners with a plot to follow, which will enable them to acquire the necessary skills, and within which learning achievement can be reliably and validly ascertained.

The act of designing powerful models of learning and instruction comprises putting together into an integrated whole, what is known about what works as far as learning is concerned. While models of instruction such as problem-based learning have been widely used to support learning for a very long time in a variety of contexts, there aren't any particular fixed approaches to these processes. In fact there are very many iterations of the generic problem-based approach to learning, and all of them are probably just as powerful for their particular educational settings. This leads to the conclusion that the design of learning and instructional environments is -- to a large extent -- a creative process, not unlike architectural or engineering design. In all of these instances, the designer is engaged in putting together a conceptual model that integrates what is known about what works in that particular setting. When this design task is expertly performed, its operationalization, and the chances of its success are optimized. In the context of learning, this would mean a powerful teaching strategy and also a successful learning experience for the learners.

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Author

Dr. Som Naidu, Adjunct Associate Professor (UMUC)
And Associate Professor and Head of Research and Evaluation
Department of Teaching, Learning and Research Support
The University of Melbourne,
Victoria, Australia
s.naidu@unimelb.edu.au

STUDENT SUPPORT SERVICES FOR E-LEARNING: COLLABORATIVE TUTORING AND AUTHENTIC ASSESSMENT

Gearóid Ó Súilleabhain & Ray Coughlan, Cork Institute of Technology

Tutorial Provision in Traditional Distance Education

A wide range of evidence suggests that important factors of motivation and persistence may actually be diminished by common characteristics of e-learning courses as they are currently designed and delivered. Studies suggest that dropout rates for online courses range from 20 to as high as 50% (Clark 8, 2003). In the words of one well-placed observer, “the challenge for online education providers ... is, not so much how to recruit students, but how to retain them once they have begun”. (Ludwig-Hardman 2003).

In traditional “second-generation” distance education, based, in part, on the theoretical foundation of Tinto and Bean and Metzger’s research into student integration/attrition (Rovia 2003) and certain models and frameworks of ‘mediation’ dating back to the work of Holmberg and Moore (Tait 2003) as well as the long-standing practices of the big name open universities; the challenge of high drop-out rates are typically answered through the provision of face-to-face tutorials. The UK Open University for example, has, since its foundation, provided (non-mandatory) access for all its students to a personal tutor in a group with no more than 25 other students in order to allow personal knowledge, support and understanding to grow up through the lifetime of a course. (Tait 2003).

Ongoing research seems to affirm the validity of the approach. As Mason writes:

Studies of OU students going back over nearly thirty years continue to show that students value face-to-face tutorial (and) request more of them whenever asked (Mason 1991)

Face-to-face tutorials play the additional role also in 2nd generation distance education, as pointed out by Robertshaw (quoted in Fahy 2003), of counteracting what might be seen as the overly “industrial: or mass-produced nature of much of the materials, as well as representing a basic recognition of the personal and public/social character of education itself (Garrison 2002).

Third Generation Tutorials

However, despite indisputable evidence of their use to students, it is worth mentioning the obvious fact that face-to-face tutorials, though used to counteract the perceived disadvantages of learning at a distance, can undermine its advantages also, such as the independence of time and place and the economies of scale (Daniel 57). Mason also queries, as have others before her, whether the costs of tutorials are commensurate with the educational benefit. She goes on to cite evidence that some students in today’s world of HE may be “choosing flexibility over hand holding” (Mason 1993), i.e. the convenience of the online over the inconvenience of the face-to-face.

The use of online tutorials rather than face-to-face ones, while they re-achieve advantages of time and place independence are often seen as highly expensive to provide. Rumble calls this kind of online learner support the “least costed ingredient in the costs of online learning”. (Rumble 4). One strategy for overcoming this problem is to make use of pedagogical techniques and models, which leverage more student learning for less tutor/mentor input (Goodyear 2002).

Thorpe’s account of ‘third generation student support’ represents such a ‘high leverage’ approach (Thorpe 2003). The web, she argues, has the capacity to blur the conceptual distinction long made in ODL (e.g. Keegan 1996) between course development and learner support by using the learners themselves as a resource - “to build on their experience, reading and perspectives”. (Thorpe 204), thus adding a fourth point of orientation, that of the learner group itself, to the traditional triangle of course materials, tutor and learner.

The E-Learner and The Authenticity of Learning

Thorpe's model is at odds with what Freire's famously dubbed the "nutritionalist" model of education, still very much the dominant model in HE, which organises its participants hierarchically in accordance with their status as official authors of knowledge but sits well with the changed/changing profile of the typical e-learner, who as many commentators have noted, is likely to be an adult "lifelong learner", returning to education/training to obtain knowledge and competencies to become more effective and more employable in the workplace. Today's learner, Paloff and Pratt note:

Although their previous educational experiences (may) have been traditional... (are) looking to enter a partnership that results in the achievement of specified learning outcomes. (Paloff and Pratt 181)

The demand is for continual professional and work-related training. As Bates writes of the changing landscape of Higher Education today:

... universities and colleges are facing an important increase in demand from all those in the workplace who need to continue learning if they are to stay employed and if their employers are to remain economically competitiv: (Bates 12, 2000)

In this context of 'learner as customer' and the broader context of the explosion of knowledge itself in our society today as well as the concomitant and accelerating need for new professional skills, competencies, the theme of authenticity, i.e. relevance to authentic or real-world situations, emerges as a primary concern for the range of stakeholders in the learning process. Higher Education today must not only incorporate an understanding of adult development (cf. andragogy) but also an understanding of and promotion of the relevance of its courses to the worker in the workplace. Among the list of activities traditionally listed among student support services, those of assessment and testing are of critical importance here, not just because 'assessment is at the heart of the student experience' (Brown and Knight 1994); defining what students regard as important, how they perceive themselves as students, etc. but because an *authentic* assessment methodology also implies the setting of authentic activities; addressing central issues such as whether the activity is *representative* (in terms of being broad enough to allow for the adequate assessment of the constructs being tested) and *direct* (in terms of being narrow enough not to be confounded with irrelevant information) (Messick 1992, 1996) as well as various related psychometric and logistical issues.

Just as 3^d generation 'constructivist' tutorial support was earlier suggested to be breaking down a traditional distinction between course development and learner support, proper authentic assessment methodologies effectively break down the distinction between the learning activity and its assessment, as typified by end-of-year high stakes summative examinations or, in the dominant model of assessment for e-learning, auto-corrected 'quizzes'. The literature supports a number of other claims on behalf of authentic assessment which can be summed up under the broad categories of 'improved assessment' i.e. the way in which it goes beyond the limits and inappropriateness of standard summative testing, and "improved learning", i.e. the way in which the authentic assessment experience is variously argued to be more meaningful, more 'real' and/or more encouraging of 'constructivist/active learning' and critical thinking (McAlister, ed).

The development of authentic and reliable assessment tools for the e-learning environment would, in addition to achieving some or all of these benefits, also represent a 'good fit' with the needs of the typical e-learner, and other stakeholders in the contemporary HE process, as well as good fit with the range of learning theories long associated with e-learning technologies (e.g. constructivism, active learning, inquiry-based learning, collaborative and peer learning etc), which emphasise the central role of the learner in the learning process and the role to be played in the process by interaction between learners. Authentic assessment is about appropriate assessment for a view of learning that goes beyond the simple recall of facts, principles, procedures, etc into the area of creativity, problem solving, analysis or evaluation (Bates 2000, 13)

The E-Portfolio

In this regard the recent attention being paid to the use of the web to support portfolio assessment holds much promise for the evolving world of e- learning. It is a development which according to Batson (2003) can be seen as arising out of three interrelating trends or facts:

- Student work now being mostly available in electronic form, or as Batson says, “based on a canonical electronic file. We can add that even where it is not, the process of digitization is becoming ever simpler and cheaper with time.
- The web, according to Batson, “is everywhere”. Although not yet a ubiquitous technology, the web is certainly becoming more and more prevalent and the tendency, particularly at Higher Education level, is for an overwhelming majority of students to have web access and ‘web literacy’.
- Databases are available through websites, which provides users with the capacity to manage large volumes of data and information online.

“E-portfolios”, as they are coming to be known, in their many forms can support a form of authentic assessment for the web which:

- can feature multiple examples of work
- can be context rich
- can offer opportunities for selection and self-assessment
- can offer a view of learning development over time (Cambridge, B. 2002)

- while simultaneously freeing the author from the limitations of the e-portfolio’s older paper counterpart and making available the oft-quoted benefits of e-learning in terms of openness, flexibility, transparency, etc.

Some, unsurprisingly, claim that the e-portfolio represents a new revolution in e-learning and a burgeoning industry seems to have grown up to support the expectations and promises of academics and researchers in the field. A total of 30 separate e-Portfolio tools defined as “now available or in production”, are referred to in a recent article on the subject (Batson 2003). A number of issues appear, to the authors, critical to the success of this new e-enterprise:

- Interoperability standards
- Integration with existing e-learning systems, esp. commercial LMS’s
- Systems and methodologies for evidence/artefact validation
- Supports to increase inter rater consistency/reliability, e.g. support of shared rubrics
- Data/information management and mapping
- Security of data (How? Who?)
- Storage of data (Who? Who?)
- Supported file/media types (Which?, Why?, How?)

As with Thorpe’s new generation of student support services, the role of the tutor or mentor must be seen as central to facilitation of the process here, in terms of mediating, supporting and monitoring the process of creating the e-portfolio. Further research into this role and the responsibilities and skill sets which constitute it are urgently required, along with longitudinal studies of the range of e-portfolio practices now in evidence in and beyond the Higher Education world in order to sustain and substantiate and add credibility to both the concept and the process.

Conclusion

The authors suggest, in conclusion, that tutoring and assessment are central, in the first place, to what are conventionally known as student support services and are very much the activities upon which all other services (e.g. special needs services, intervention service, induction-type services) must be based upon. In the second place the facilitation of collaborative tutoring and authentic assessment methodologies for

the e-learning environment represent a blurring of the traditional distinction, between, respectively, course development and learner support, and the learning activity and its assessment, as well as, *en masse*, a breaking down of the division between *learning* and learner support. Together they hold promise for the ongoing evolution of e-learning in terms of addressing the needs and characteristics of the lifelong e-learner, ensuring the relevance and quality of e-learning courses and impacting fundamentally on the way we plan, design, deliver, assess and *think* about e-learning and distance education in general. In the context of high drop out rates, dissatisfaction as to the quality of many e-learning efforts and the expensive failures of many recent high-profile and lesser-known e-learning initiatives in higher education, a new model of e-learning practice with collaborative tutoring and reliable authentic assessment methodologies, incorporating some variant of the e-portfolio, at its heart has much to recommend it as a way forward for all stakeholders in contemporary Higher Education.

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Authors

Gearóid Ó Súilleabhain and Ray Coughlan
DEIS, Department of Education Development
Cork Institute of Technology
deis@cit.ie

THE WEB-BASED PORTFOLIO AND LEARNING JOURNAL IN THE MDE PROGRAM - SUPPORT FOR A WORK IN PROGRESS

Christine Walti, Carl von Ossietzky University of Oldenburg

1. Introduction

The Master of Distance Education program (MDE) was launched in January 2000 by the degree granting University of Maryland University College (UMUC) in partnership with the Center for Distance Education at Carl von Ossietzky University of Oldenburg (ZEF), which contributes two of the six integrated certificate programs. The Master's and certificate programs are completely accessible online. The MDE sets out to "... qualify present and future managers of distance education in both public and private education, as well as in the training sectors.... These managers need to be qualified as leaders, since they will be required to be active advocates for distance education and training in their organizations and need to manage significant change processes...." (Bernath & Rubin, 2003, p. 20).

This conference contribution outlines the history of the 'portfolio' in the context of the MDE, the theoretical underpinnings for its use, the issues and questions that arise, the difficulties encountered and the steps that have been taken and are being planned to support students in the development of their portfolios and accompanying learning journals.

2. The Framework

The MDE program was developed in 1999 based on previous experiences with a virtual seminar for professionals in distance education (see Bernath & Rubin, 1999). The then innovative concept of portfolios as an element of assessment was introduced in the syllabus of the first course in early 2000. The guidelines state that

Each Master's student will work towards the development of a personal portfolio. The goal of the portfolio is to demonstrate your qualifications gained in the field and to provide evidence of your competencies and skills in a variety of disciplines/roles. It is our hope that this Portfolio would end up being your passport to the professional world. The portfolio contains formal and voluntary documents. Formal documents are appropriate assignments and other contributions to the final grades in each course. Obviously you will want to choose your best. Voluntary documents may show any other kind of active participation while you have been enrolled in the Master's program. These voluntary contributions allow students to show their proficiency and skills as a professional distance educator. In addition, the Portfolio will contain your Resume or Curriculum Vita, and may contain a photograph and graphics. This portfolio is a requirement for successful completion of the final Distance Education Project course.

Each student is responsible for keeping a permanent copy of the various assignments and documents from each course. You should not rely on WebTycho to be your storage area nor should you rely on a UMUC student computer account, since these will sometimes be deleted. You should keep copies on your own computer and remember to keep (several) back up copies on floppy disks. (OMDE690 The Distance Education Project and Portfolio, 2000, ¶6).

The introduction of portfolios also alleviates some of the uncertainty associated with the origin of students' contributions and assignments in a completely online program and thus increases the reliability of grades.

The MDE begins with the course *Foundations of Distance Education* (OMDE 601), where the idea of the portfolio is introduced and concludes with the required capstone course *The Distance Education Portfolio and Project* (OMDE 690). During the course of the almost four years in which the program

has been offered, the guidelines for the portfolio have been steadily improved and refined. This has been most prominent in the capstone course and with postings to the MDE Homepage.

While the students become familiar with the learning environment and the involved technologies in the program, the concept and maintenance of the portfolio throughout the program has not always been systematically and consequently emphasized. Experiences in the capstone courses have shown that students are often conceptually and technically ill equipped to develop web-based portfolios when they register for this final course. This circumstance leads to a steep learning curve and much more time needed than planned or envisioned for the completion of the portfolio in the 15-week course.

It has become clear that portfolio development requires more guidance, in more detail and with more consistency and the program managers have taken on this responsibility. A number of decisions to support students in this ongoing work in progress have been made:

- A tutorial is to be developed that will introduce students to the idea of portfolios and learning journals and the skills and tools needed to support its ongoing ‘construction’;
- The tutorial is introduced to students in the Foundations of Distance Education (OMDE 601) course and a link to and a reminder of its importance is made available in all MDE courses;
- Students must submit a draft of their portfolios prior to registering for The Distance Education Portfolio and Project (OMDE 690).

With these steps all students – including those who aim for certificates - will have been introduced to the idea of portfolio building, reflective learning and the tools that can aid them in this process. This encourages reflection and learning throughout the program, facilitates consistency and mastery, alleviates anxiety and bolsters students’ confidence when working in the final course of the program.

3. The Portfolio

3.1. What are portfolios?

The idea of portfolios as such is not new, however the digital form in which students must submit the portfolio - as a web page or a web site (OMDE690 The Distance Education Project and Portfolio, 2000, ¶11) - and the required skills are. For this reason the term ‘web-based portfolios’ is used in this article. Many examples exist and will be illustrated in the tutorial.

In the MDE Program the web-based portfolio can be a collection of work (assignments, research papers, essays, projects, faculty feedback and comments, photographs and graphics) around learning goals, the rationale for selecting specific items, the learner’s reflections on the achievement of these goals and on the portfolio on a whole - “...a focus on growth and development over time, implemented through selection, reflection and inspection” (Barrett, 2001, ¶ 5). The MDE also stresses the importance of the portfolio as the “...passport to the professional world” (OMDE690 The Distance Education Project and Portfolio, 2000, ¶ 6) and must also include a resume and/or Curriculum Vita. Using the Web gives students control in assembling, organizing, revising and integrating new materials throughout the course of their studies. Avraamidou & Zembal-Sual’s (2002) research shows that “... portfolio development is a constructivist process that facilitates connections between concepts and practices” (¶ 33) and takes process and product into consideration.

3.2. Formal set-up

The students are responsible for their portfolios. Being involved in a portfolio development process allows the students to monitor and reflect their progress in the program. It is controlled by students and can be aligned with curriculum, instruction and assessment. It reflects learning experiences and can be used with potential employers.

It is important to introduce the portfolio early (Barrett, 2001; Kubler LaBoskey, 2000) and provide support to tackle the development phases with guidance from the instructors in MDE 601 and 690.

The portfolios are not evaluated, but specific components should be included in each portfolio and assessment is either 'pass' or 'fail' (OMDE690 The Distance Education Project and Portfolio, 2000, ¶9). Other than that the format is open and there are very few prescribed requirements for content and none for structure. The program's goal is to provide flexibility in aspects such as organization, content, ideas and presentation.

Portfolios provide the student with the opportunity for deliberation and decision-making relating to questions and issues that are most important to her/him. The advantage, if introduced at the beginning of the program and consequently followed up on in subsequent courses, is the extended period of time where a number of items can be collected (and discarded) and an ongoing reflective process takes place making the process a 'normality'. This in turn could promote a portfolio 'culture' and the continued use of the portfolio in a holistic and life long learning environment.

In the process of portfolio development Barrett (1999) designated different levels and stages to address. These include:

- Collecting and organizing ones work, which is determined by the portfolios purpose, goals, audience and intended future use.
This also includes thoughts on designing and planning the presentation, identifying software and storage resources, assessing ones skills and being aware of limitations (internal and external).
- Selecting from the collection what best demonstrates the specified objectives and goals and show individuality.
- Reflecting on the selected items and the portfolio as a whole. The learning journal serves as the basis of long term recording of reflection and self-assessment and as a tool for metacognition.
- Inspecting and self-assessing the goals, identifying patterns, and sharing with peers and instructors (in MDE 690). Set goals for future learning in order to use the portfolio as a professional development tool and for future employment.
- Presenting and publishing in the appropriate manner and evaluating the portfolio's effectiveness in light of purpose and context.

The portfolio should include "... the rationale (purpose for forming the portfolio), intents (its goals), contents (the actual displays), standards (what is good and not-so-good performance), and judgments (what the content tells us)" (Paulson, Paulson, & Meyer, 1991, p. 62). Although the portfolio may serve different purposes at different times these should not conflict with one another and only contain what the student is willing to make public to a specific audience. Aside from showing growth over a period of time it provides a forum that encourages students to develop the abilities needed to become independent and self-directed learners (Ibid, p. 63).

3.3. Advantages

The advantages of creating web-based portfolios are numerous. The focus on growth and development over time through selection, reflection and inspection of course work, goal setting and self-assessment coincides well with the MDE program's constructivist approach and builds self-confidence. It offers a method which not only identifies ones strengths but gaps in learning, which can generate future learning goals (NSCC, 2003). And, it can enhance a student's multimedia skills thus adding an additional benefit to one's employability.

The storage space is minimal; the portfolios are portable and easily shared and accessed and have developmental potential beyond the program. The outcomes will result in unique collections of work, are learner centred and controlled, and provide a valid and balanced picture of a student's learning process against the program's intentions. Over time it can help tell the MDE program's story and its impact and may also provide a richer picture of the program's participants and their needs. It can be one tool to assess and reflect the program as a whole. Finally, Cooper (1996) believes offering

portfolios as an additional form to demonstrate ones abilities may make a program more attractive to potential students.

The students are the primary users and beneficiaries of portfolios "... using it as a tool to map their own progress as learners in terms of ... abilities and ... outcomes" (Alverno College, 2003, FAQ 9).

3.4. Issues and Difficulties

The issue of time management for students and faculty was one of the primary concerns in the MDE program. The first students had little structured support for the portfolio development, which led to steep learning curves in the capstone course *The Distance Education Portfolio and Project* (OMDE 690) itself. New policies are being introduced and future students who wish to register must first provide a portfolio outline. Consistent reminders to students will be provided in order to enable an ongoing process and making it more manageable.

Topics that need to be taken into consideration when planning the development of a portfolio are storage space for items; self-reflection and feedback; security and the ability to set viewing permissions; organizing links and grouping, as well as publishing and adapting the portfolio for the intended audience.

Using a 'generic tools approach' (Gibson & Barrett, 2002) allows for a broader framework of creativity, but impedes the evaluation of the product. The learning journal (point 4) is used to capture the process of the portfolio development, adjustments, and the learner's growth over time. However, limited validity and reliability make evaluation and comparability difficult. Standardization requires well defined evaluation criteria and rubrics (Neiman, 1999, ¶. 15) and takes time and testing. It is not necessarily the outcome intended in our program because it can conflict with the special qualities of portfolios. Parsons (1998) reminds us that linguistic and cultural backgrounds and boundaries also need to be taken into consideration.

The use of portfolios over the duration of the program necessitates faculty/instructor training to handle and deal with portfolio development and even to re-think course design to accommodate the notion of portfolios (Batson, 2002). Long term extra burdens cannot be placed on faculty nor is there room for disruptions as reported by Nidds & McGerald (1997). Currently the task is in the responsibility of the instructors in MDE 601 and MDE 690 and the program directors. The tutorial is introduced in MDE 601 as the entry ticket to the portfolio process; the final product in MDE 690 is the pass to a successful conclusion of the program.

Strategic and policy issues beyond the MDE program are not addressed, however the efforts encompassed in the portfolio development may stimulate discussions around and help determine the scope and value of 'e-identities' (Ittelson, 2001) for students.

3.5. Technology

There is no prescribed portfolio software in/for the MDE program, although it exists. Instead, commonly available tools that are low cost (or free) and low technology (thus keeping the development process flexible, and at the same time acknowledging that students need support) are introduced and described. The tutorial illustrates this more closely.

What students will need is access to a server (provided by UMUC), storage capabilities (floppy, CDROM or zip), authoring software (Frontpage, Dreamweaver), the skills to use these tools and awareness of the questions associated with these (i.e. privacy issues). Other tools, programs, software or multimedia will depend on the students and their own developmental choices. Again, the students are responsible for collecting and storing items and in charge of the tools they wish to use.

4. Learning Journals

4.1. What are Learning Journals?

Journal writing is an intentional reflective design strategy used in various learning environments to facilitate and support the development of insight, reflection, cognitive awareness, critical thinking and to promote personal growth. Journal writing is a means of communication with the personal, professional and academic self (Fichten, 2000; Andrusyszyn, & Davie, 1997). Of particular interest for the MDE program is literature that suggests responding and writing responses in online environments showed increased reflection (Burge, 1993; Andrusyszyn, & Davie, 1997; Fichten, 2000). While responses in the courses are (semi) public, the learning journal is private.

4.2. Rationale

In order to support the process of reflective learning in individual courses and in the portfolio process as a whole the use of learning journals provides a framework. Their use not only documents the developmental process of the portfolios - making it more than just a 'showcase or selection of work' (Neiman, 1999, ¶ 7) - but supports the documentation and self-assessment of processes. It 'keeps records', encourages metacognition, ownership and control and provides guidance. The learning journal will be the basis from which steps, missteps, decisions and successes can be extracted (Hill, Kamber & Norwick, 1994).

Additionally learning journals can capture research interests, literature and links that can continuously be built upon during the program and will be available when the final project in the capstone course must be tackled.

Steps, styles and advice on learning journals will be illustrated in the tutorial.

4.3. Advantages and Issues

The learning journal and the portfolio compliment one another. At a more basic level the learning journal can be used to record events on a course basis and create transparency in ongoing processes. At the end of the program it can be pulled together at the portfolio level.

In the WebTycho learning environment, the UMUC platform with which the MDE program works/runs, discussions in the classes are often fragmented and difficult to capture, especially with large volumes of communication and interaction. To date there is no sensible and/or easy way to store these messages. The workbook provided in WebTycho provides a temporary space during the course, but is not user friendly or accessible over a longer period of time.

The learning journal can provide a space where conference 'threads', workbook entries, assignments, feedback and study group activities can be stored in a structured fashion and will be available to review at any time to explore connections between courses, topics, issues and personal development.

Barriers to the learning journals may be the additional time needed to maintain and manage the task. In addition, it is yet another 'writing' activity in an already text-heavy environment. It demands self-discipline, motivation and the opinion that it carries a worthwhile value. However, when regarded as a 'safe learning place' and not associated with grades or evaluation and with some practice and experience, it is reasonable to assume that value for many students may evolve. Given the graduate level of the program attitudinal barriers (self-doubt, fear of exposure, feelings of threat, painfulness or discomfort) should generally not be a major concern. If so, the introduction of learning journals may have the unintended positive consequence of a safe haven in the online learning environment. Here, as with the portfolio, frequent and regular reminders within the program and individual courses to keep up the process will most certainly be necessary and along with the tutorial itself constitute an important support element in the program.

The learning journals will not be assessed or evaluated on a course-by-course basis for the same reasons mentioned with regard to the portfolios. Nor is it this author's opinion that it should be considered a mandatory part of the portfolio and assessed in the final course (see Kerka, 2002 for a

review of literature on the assessment issues of journals). However, it is a tool that supports the development and finalization of the portfolio.

A number of possibilities exist to write/produce learning journals. From a simple learning journal in a text editor to more sophisticated possibilities such as blogs and wikis (Godwin-Jones, 2003) will be discussed and presented in the tutorial. Again, the main focus is on a variety of low cost and easy to use tools. The advantage of a web-based tool is that it can be linked to other logs, workbooks and be integrated in the portfolio.

5. The Work in Progress

5.1. The Connections

Experiences in the MDE thus far and in research have shown that students must be supported in developing their portfolios. The topic of continuous portfolio development must be frequently mentioned to the students and MDE faculty must be made aware of this ongoing process in order to provide the information in their courses and link to the tutorial. This helps ensure that growth and learning are reflected on and students are well prepared to enter the final course *The Distance Education Portfolio and Project* (OMDE 690). Much of the anxiety and pressure felt thus far can be relieved. The tutorial for the web based portfolio and the learning journal will provide structure and guidance with regard to purpose, data structure, type of data, storage, control, design, technologies needed and available, as well as tools to facilitate the development of skills. Time will tell whether regular upkeep and completion of both elements can be achieved and the two activities compliment one another thus providing a richer process and a holistic product.

5.2. The MDE Tutorial

The tutorial for portfolio development and learning journal writing aims at providing background information on portfolios and learning journals with regard to theory, concrete practice and examples. Maximum student flexibility is stressed by introducing generic tools and seeks to take into account the different levels of students' skills and emphasizes free or low cost tools.

The tutorial will be demonstrated at the conference and is currently still in development; a preliminary link is available, however the link and content are subject to change:
<http://www.uni-oldenburg.de/zef/christinewalti/tutorial>

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Author

Christine Walti, MDE & MSW, MDE Faculty
Carl von Ossietzky University of Oldenburg, Center for Distance Education
D - 26111 Oldenburg/Germany
Private: 919 Bethany Court, Annapolis, MD 21403 USA
christine.walti@uni-oldenburg.de

THE ROLE OF LEARNER SUPPORT IN INSTITUTIONAL TRANSFORMATION – A CASE STUDY IN THE MAKING

*Jane E. Brindley, Carl von Ossietzky University of Oldenburg and University of Windsor
& Ross H. Paul, University of Windsor*

Introduction

With the democratization of higher education in recent decades has come increased accountability for the performance of universities and a greater focus on their outputs. Students are much more demanding of services and support, and governments and taxpayers want more demonstrable benefits to their investments.

An important component of this democratization has been the rapid growth of distance teaching and open learning institutions around the world. While the issues of student motivation and support are common to all educational institutions, the challenges are perhaps more stark where learners are overtly separated by time and space. From this perspective, campus-based universities have a lot to learn from the experience of distance educators.

A particularly interesting facet of distance learning is the development of a comprehensive and integrated approach to learner support, the term used in open and distance learning (ODL) to describe a full range of activities developed to help students meet their learning objectives and gain the knowledge requisite to course and career success. Learner support includes all those interactive processes intended to support and facilitate the learning process from the student's first point of contact with the institution, including tutoring, teaching, counselling, advising, orientation, administrative services and even peer tutoring and alumni support.

While earlier models of distance education assumed independent and self-actualized adult learners, experience proved otherwise -- retention rates were often extremely low, especially where isolated students were left to fend for themselves, and it was soon clear that open learning institutions could not merely coast on the backs of an elite group of highly motivated adult learners. Now, with 30 or more years of experience behind them, most open learning institutions have developed comprehensive and sophisticated systems of learner support that are based on a strong value system of access to fair opportunity. These can serve as models for campus-based institutions that have long assumed superiority in this area.

Using a case study of a traditional, campus-based university in transition, Canada's University of Windsor, this paper explores some of the lessons learned from the development of learner support in ODL and outlines current efforts to take them into account in the strategic vision for the University's development over the next five years.

The Challenge of Establishing a “Learner-Centred” University

In all western jurisdictions, the most selective and research intensive universities have the highest status and prestige. There is a strong correlation between entering academic averages and reputation, and long-established universities in particular have capitalized effectively on such status. This magnifies the challenge of enhancing the profile and reputation of an institution like Windsor, with its more open approach to admissions and wider range of academic programmes, both driven by the desire to offer enhanced opportunity to students in the local region.

Capitalizing on the success of its strategic plan for 1999-2004, which completely reversed previous downward enrolment trends, reallocated resources to areas of strength and potential, identified pinnacle areas and developed a stronger culture for research, and significantly internationalized the institution, the University of Windsor recently adopted a new plan for 2004-2009 (University of Windsor, 2003).

The hallmark of this plan was to give operational meaning to the notion of a “learner-centred” university, one widely recognized for its stimulating and supportive campus climate and the demonstrable qualities of its graduates. While, at first glance, aspiring to be a “learner-centred” university may seem a tautology, a common criticism of modern universities has been the relative lack of attention given to issues of teaching and learning.

The essence of the changes envisioned for Windsor is to focus on difficult-to-measure “outputs” rather than the more common indicators of success, the “inputs” of entering student averages and demand for student places. A closely related characteristic of the University’s strategic plan is its emphasis on “the degree that works” in its broadest interpretation, reflected in careful monitoring of alumni success in graduate school and employment. These initiatives are in addition to the standard goals of improving the institution’s support for research, community service and internationalisation.

This emphasis on learner support and graduate attributes lends itself well to increased pressures for accountability from government, taxpayers and students, but it also raises major internal challenges for a university. Before discussing the University of Windsor case, it is useful to explore the evolution of learner support in institutions of open and distance learning.

What Can Be Learned from the Experience of Learner support in ODL?

Early notions of the “industrial model” of distance education (see, for example, Peters, 1983) were concerned more with access and availability of learning opportunities than the individual experience of the learner. The underlying assumption was that working through well designed packaged materials, whether print-based or offered through other technologies, in itself constituted “a learning experience”. Evidence quickly debunked this notion as isolated, unsupported and/or ill-prepared learners struggled to cope with the learning materials with little or no assistance from the institution. With the increased access that open distance institutions offered, enrolments were high, but with so little support for learners, attrition rates were as well (Keegan, 1983), particularly for first-time learners.

Concern about attrition and academic credibility spurred efforts to find ways to promote persistence, mainly through the development of learner support services. At first, these were mainly limited to contact with a tutor or faculty member over course content. However, other forms of support quickly followed. O’Donnell and Daniel (1979) proposed one of the earliest models for student development in a distance education setting, arguing that it could not be assumed that adult students have all the skills necessary to “plan their lives, career and education, set realistic goals and study effectively” (p. 1). In gradual response to such challenges, effective support in the form of academic advising and counselling, regional offices with a variety of administrative services, summer schools, and group tutorials was developed.

The irony is that there has probably been more progress in the provision and evaluation of the impact of learner support in ODL institutions than on mainstream campuses in recent years, perhaps because learner difficulties are more overt when students are more obviously separated in time and place from their institutions. Researchers and practitioners in the field of ODL, whether faculty immersed in their own discipline, counsellors, administrators, or other learner support personnel have had a lively and continuous dialogue about how to help learners overcome these barriers. As such, there is a rich history and literature in learner support in ODL to draw upon. Many of the same issues of isolation and lack of support have long prevailed on university campuses but they have been far less evident or acknowledged until recently.

Sewart (1993) describes mass higher education at campus-based institutions, noting that there is an attempt to address the shortfall between a one-to-one teaching and learning process and the depersonalized system of the generalised lecture with “...an assembly line method in which all the parts are fitted to the whole by a series of specialists” (p. 4). He refers to content tutors such as graduate teaching assistants, career counsellors, academic advisors, and other support personnel. Rumble (2000) discusses the response of large campus-based institutions to a rising consumer orientation of students and the decline of the central role that post-secondary education once played in their lives, observing a tendency for such institutions to become more bureaucratic and, paradoxically, more depersonalized for individual students. He compares this to the practice of student support in ODL, and notes that

...distance educators have already had to think through some of the issues raised, and in many ways are ahead of the game...We have always had to think through our support services, trying to find the best delivery mechanism for students who will never come on campus because the campus, in the traditional sense, does not exist (p. 218)

In ODL, learner support has been a central issue of interest to distance educators for the past two decades as practitioners and researchers have tried better to understand the experience of the distance learner, what holds learners back, and what contributes to persistence and success in the learning process. Hence, the development of learner support in ODL has paralleled and reflected the change in conceptualization of education as transmission of pre-packaged knowledge to that of a dynamic transformative process, focusing on developmental constructivist models of teaching and learning and findings ways to engage the learner as an active and central participant in the learning process.

Sweet (1993) focused on the implications for a changing role of learner support as distance education evolved from the more passive industrial model to new, more interactive forms of learning. He envisioned a closer alignment between traditionally distinct advising and tutoring tasks in distance education to promote more interaction between students and instructors through either mediated or face-to-face means (p. 1). A central figure in the development and management of the decentralized learner support model at the UKOU, Sewart (1993) emphasized the importance of context in the development of learner support services, taking account of such diverse variables as student needs, the educational ethos of the institution and region, the dispersal of and generic differences within the student body, and relative levels of resource.

Brindley (1995) built on these notions to recommend building a service model based on the particular mission and goals of the institution and informed by research findings. Its goals should be to develop learner support services that are more responsive to learner needs, contribute to learner persistence and success and, of particular interest to this paper, to play a key role in the strategic positioning of an institution or distance education service (p.118).

Tait (2000), identified three primary functions for learner support in ODL – “cognitive”, “affective” and “systemic”, all of which are crucial to student success. Cognitive support facilitates learning through the mediation of the standard and uniform elements of course materials and learning resources for individual students; affective services provide an environment which supports students, creates communities and enhances self-esteem; and systemic support services establish administrative processes and information management systems which are effective, transparent and student-friendly (p. 289). Tait emphasizes the essential and interdependent nature of these functions that work together to create “... an environment where students feel at home, where they feel valued, and which they find manageable” (p. 290).

Simpson (2002) moves away from a systems approach, instead providing a typology of learner support categorized by activity (e.g. advising, advocacy) rather than by specific personnel or department. Thorpe (2003) takes the crossover in functions a step further in addressing the need to rethink learner support in the context of the online environment. She defines learner support as “...all those elements capable of responding to a known learner or group of learners, before, during and after the learning process.” (p. 201). This definition appropriately blurs the traditional distinction between learner support and course production. In online learning, course materials may consist only of a syllabus and a list of required readings, with the content being created through interaction among learners and between learners and instructor. Thorpe’s conceptualization recognizes this important evolution and describes the cross-functional, interactive, responsive, and individualized nature of learner support.

Anderson (2003) notes that pressures for access and availability of net-based telecommunications are both forcing and offering the opportunity to re-examine the most effective use of finite and valuable faculty time. He stresses the need for evaluating all types of interaction (learner-learner; learner-instructor; learner-content) by their contribution to the learning process. This premise can be extended to other learner support professionals. Kvavik and Handberg (2000), in describing the transformation of student services at the University of Minnesota, discuss the need to reconceptualize the role of student service professionals as “...generalists who serve as facilitators and navigators in an information-rich environment that is shared by provider and client alike” (p.31). These writers

illustrate efforts to use learning support resources (human and technological) strategically to promote desired learning outcomes within the context of institutional mission.

It is apparent from the literature (e.g. Granger and Benke, 1998) that practitioners and researchers in ODL have become increasingly clear about the role of learner support in helping students become more independent, collaborative and effective learners. Administrative systems are designed to be transparent and give students maximum opportunity for control and self-help (Kvavik, R. B. and Handberg, M.N., 2000). Interactions with teaching staff are intended not only to help students master content but to build the skills needed for independent and collaborative learning (McLoughlin & Marshall, 2000). Librarians go beyond information access and retrieval to helping students become information literate -- to develop research questions, think critically, and navigate and evaluate the reliability, validity, and usefulness of the overwhelming amount of information available to them (Canadian Library Association, 2000). Advisors and counsellors help students to acquire the skills necessary to engage in self-assessment, plan, make sound decisions, study effectively, and to overcome barriers to academic and career success (Potter, 1998). Interfunctional collaboration provides a transparent and seamless system where learners can get the type of support they need easily and when required.

As technology has allowed, ODL learner support has become increasingly sophisticated with the introduction of online classes with both synchronous and asynchronous communication, online registration and advising and library services, e-mail support, chatrooms and bulletin boards, interactive web-based counselling, and around-the-clock help desks (Krauth and Carbajal, 2000, provide a comprehensive guide to good practice in online learner support). Kvavik and Handberg (2000) discuss the transformation of learner support services from a "...public utility role to strategic contributors to the management and growth of university instructional programs" (p. 30), and note that learner support can play a central role in meeting the institution's strategic academic and economic objectives.

Robinson (1995), in a review of learner support research in ODL, points out that more theory building and systematic studies that build on existing knowledge are needed. She also notes the difficulty of reconciling the needs to address pressing local issues with a broader research agenda for the field of learner support, and acknowledges that small contextually based studies (characteristic of the ODL literature on learner support) form valuable contributions to our knowledge base. Other writers have pointed to the need for more evaluative studies so that the positive impact of learner support can be clearly demonstrated and investment justified. Mills (2003) states, "We need to demonstrate the added value of student support if we are going to convince the managers of institutions that it is worthwhile allocating resources to this aspect of distance learning" (p. 111). At the same time, Mills, a long time leader in the field of ODL, quite clearly believes in the "added value" of learner support. In the same piece, he argues that "...by planning learner support as an integral part of a teaching and learning programme, rather than an afterthought which can be excised when times get difficult, institutions can demonstrate a recognition of the link between income generation and learner support (p.104).

Although not all institutional budget allocations may reflect it, learner support is now seen as not only a legitimate, but a very necessary part of distance education practice regardless of the mode of interaction with students. As such, it requires sustained research and evaluation activity in order to continually test assumptions and theories, and to measure the effectiveness of practice. Although there is no recent comprehensive review of research on learner support, one might suspect that the state of the field has improved since the publication of Robinson's article. A major factor in this is technology, and the very positive impact it has had on our ability to gather data and share it. There is the potential to have much better student record systems, analyze data more easily, and gain access to sources of research such as online journals. For a number of years, there have been peer reviewed journals reporting research results and addressing issues of practice and evaluation in ODL. Applied research units within ODL institutions such as the UKOU Institute of Educational Technology are engaged in investigating the nature of learning at a distance, and how to increase retention and provide more effective learning environments. As Ryan (2001) notes:

In institutions with a distance education mission, learner support has involved systematic investigation and research into how student can learn in a non-classroom environment, how best to substitute for the informal and incidental learning that occurs on campus and the vast range of what Rumble (2000) calls 'consumptive service benefits'. Guidelines have evolved. The

Commonwealth of Learning, for example, has published a toolkit, “Learner Support in Open and Distance Learning” (see www.col.org/newpub.htm) (p. 74).

In summary, for ODL institutions that take learner support seriously, there is vast literature, a wealth of expertise, and a rich history to draw upon. Learner support can be a central part of the mission of ODL in offering access and opportunity—not just to a place in the educational system, but to a supportive learning environment that offers the best opportunity for academic success. Effective learner support in ODL is characterized by the following essential elements:

- a) Responsiveness:** It personalizes the learning process so as to be responsive to different individuals and groups (rather than relying on fixed elements such as a course syllabus).
- b) Interactivity:** It encourages and facilitates interaction among and between student(s), faculty, tutor, institutional support persons and academic content.
- c) Context Specificity:** It exists to further the goals of a particular institution and serves the needs of its learners within its specific context.
- d) Learner Development:** It both facilitates learning within courses and addresses broader issues of student skill and personal development.
- e) Openness to Change:** Learner support systems evolve continuously to accommodate new learner populations, educational developments, economic conditions, technological advances, and findings from research and evaluation.
- f) Integration:** Effective learner support involves a high level of inter-functional collaboration and is seamless to the learner. Perhaps most fundamentally, the previous separation of cognitive, affective and systemic learner services in distance education has increasingly been replaced by the recognition that an integrated approach to all three is critical to learner and, therefore, institutional success.

While it has always been assumed that there was much more integration of such services in a traditional university where students lived right on campus, it is postulated here that many of the same separations have long prevailed but have received less attention until very recently because they were less evident and less recognized. The University of Windsor is a useful case study in pursuing this assertion.

How the Windsor Plan Addresses the Major Issues of Learner Support

While the Windsor plan addresses a number of key areas for development, its central tenet is to give real meaning and impact to the notion of a “learner-centred” campus. The relevant components of this initiative are the following:

- 1. Emphasis on Learning Outcomes:** This envisions a major process whereby each faculty specifies the attributes expected for each of its graduates, and outlines how these will be achieved, measured and evaluated.
- 2. Teaching and Learning Initiatives:** Building on a recent *White Paper on Teaching and Learning*, the plan supports 30 specific initiatives across a wide range of issues designed to improve the quality of teaching and learning on campus.
- 3. Library Services:** The rapid evolution of high speed electronic technologies has transformed library services with Windsor and other Ontario universities leading the way. The impact has not only been to equalize accessibility to materials and journals across all institutions but to provide for stronger leadership from the Library in helping students to develop their research and analytical skills.
- 4. Campus Community:** The plan places an important emphasis on the development of a vibrant and supportive campus culture, one that encourages much better integration of programmes and services and the academic and social sides of university life.
- 5. Faculty and Staff Training:** This recognizes the need for an integrated approach to faculty and staff training and support to encourage better cross-campus communications and a common sense of mission in the process.
- 6. Flexible Learning:** The plan emphasizes enhanced support for different styles of learning, instructional design and distance education, as informed by independent reviews of Windsor by two notable ODL practitioners, Ian Muir and Tony Bates.

7. Faculty Reward System: The importance of more encouragement and support for faculty initiatives in teaching and learning is central to this initiative and builds on a previous task force's recommendations for changes to this end.

8. Co-operative Education and Internships: Work experience, voluntary internship programmes and other activities designed to assist students to integrate theory and practice across a wide range of disciplines is integral to the University's emphasis on "the degree that works" and learner outcomes, building on what is already one of the largest per capita co-op programmes in Canada.

9. International Focus and Diversity: A key to a learner-centred campus is an emphasis on diversity and exposure to many different ways of looking at the world. This is a central objective of the University's extremely successful international recruitment programme which has resulted in a campus that has more than 10% of its students coming from overseas, notably South Asia, very high by Canadian standards.

10. Celebrating Success: The plan emphasizes celebrating faculty, staff and student success to encourage the highest standards of achievement and the development of genuine campus pride, both central to the enhancement of the University's profile and reputation.

Through these measures in particular, the Windsor plan addresses all of the elements from the above review of the ODL literature on learner outcomes:

a) Responsiveness: By requiring each academic programme to specify the learner attributes it expects for its graduates and build corresponding learner support, it is responsive to the needs of individual groups of learners.

b) Interactivity: It envisions the integration of all aspects of teaching, learning and student support in ways which encourage dynamic interactivity among them.

c) Context Specificity: The plan is based on environmental scans which identify its learners, current context, and key challenges and opportunities for the future.

d) Learner Development: All initiatives are driven by the primary goal of reaching prescribed graduate outcomes, making learner development the central orientation of the University.

e) Openness to Change: Each initiative is tied to clear objectives and efforts to measure and evaluate outcomes, with services and programmes being adjusted regularly on the basis of such research.

f) Integration: Central to the plan is the recognition that all levels of learner support are essential to student and institutional success.

The Challenge of Implementing Cultural Change on Campus

While the Windsor plan goes well beyond most campus-based universities in its emphasis on graduate outcomes and learner support, the challenges of implementing the plan are significant if it is to have real impact on the activities and success of the institution.

While there is widespread support for the initiatives in principle, there is considerable concern about the pressures of time and the implications of the exercise for faculty workload. When resources are fewer, demands greater and technology has increased the pace of our lives, faculty and staff are understandably resistant to new obligations, especially if unsupported by additional resources.

In response to widespread recognition that faculty reward systems are overwhelmingly research driven, most universities have significantly increased their recognition of and encouragement for good teaching. However, there is so much pressure on new faculty to establish their research, obtain external grants and publish in appropriate journals that it is very difficult for them to give the requisite attention to innovative teaching and strong learner support, at least until tenure has been attained.

Resistance is even greater among faculty for whom such initiatives pose major philosophical or cultural issues. Academics have resisted such terms as "customer" with its implication that the student is always right and some find it insulting that it would even be necessary to speak of a "learner centred" approach in an university, worrying that it implies spoon-feeding or pampering students too much. As well, few professors are trained for teaching and learning, most taking their cues from the way they were taught in university in a kind of apprenticeship system.

The majority of faculty are products of an earlier era of university where a much smaller percentage of the population had access and where significant dropout rates were seen not as a mark of failure but as

indicators of high standards and intellectual rigour. Today's students represent a much broader base of the population and many see higher learning as a right rather than a privilege. This creates an atmosphere where students are much more demanding for service and support and exhibit an unprecedented sense of entitlement.

The difficulties of implementation notwithstanding, there is growing recognition that our universities need to be more responsive, more adaptable and more comprehensive in their approach to teaching and learning, that faculty cannot merely replicate the way they were taught, and that a separation of the cognitive from the affective and systemic is both artificial and counterproductive. The irrefutable evidence of the value of post-secondary education, both to the individual and to the society, has placed a strong onus on all stakeholders to ensure that our institutions of higher learning are very responsive to the diverse needs of different groups of learners.

Assessing the Impact of the Windsor Plan

It will obviously take some time to assess the effectiveness of the new Windsor plan. Its immediate priority is to mobilize faculty and staff to develop clear graduate outcomes for each programme. While this may be more readily realized by professional programmes such as Engineering, Nursing, Education and Law, it may be even more important for broader academic areas like the liberal Arts and Sciences, if only to make more apparent what is already known -- for instance, that their graduates have just as high employment and salary rates as alumni of programmes more overtly oriented to employment preparation.

Once these graduate outcomes have been identified and catalogued, a second level of assessment is to determine their impact on alumni success in employment and in graduate school. Finally, there is the much longer term issue of the impact of these changes on the profile and reputation of the University. The most ambitious part of this planning exercise is the determination to differentiate and build the profile of the institution on the basis of its commitment to learner support and graduate outcomes, especially at a time when all universities are promoting themselves as learner-centred.

Perhaps the most encouraging outcome of all these deliberations is their very existence and intensity. Western universities have long been accused of smugness, resistance to change and even arrogance. Times are changing quickly and "academic management" is no longer an oxymoron. Strategic planning is central to every institution's development and effective university leaders are openly embracing enhanced learner support, aspiring to much greater heights, and welcoming transparency and accountability.

Fifteen years ago, Paul (1988) decried the tendency of ODL institutions to cut back vital student services in difficult times, but the same institutions today offer much more comprehensive and integrated learner support than ever before, with demonstrable impacts on their success. Campus-based institutions have much to learn from their pioneer work and their leaders are well advised to pay more attention to the ODL literature. From this perspective, Windsor should prove a fascinating case study!

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Authors:

Dr. Jane E. Brindley,
MDE Faculty (Oldenburg University)
and University of Windsor, Department of Psychology;
Centre for Psychological Services,
Windsor, Ontario
Canada N9B 3P4
jbrind@uwindsor.ca

Dr. Ross H. Paul
President
University of Windsor
Windsor, Ontario
Canada N9B 3P4
rpaul@uwindsor.ca

SUPPORTING MEMBERS SUPPORTING LEARNERS: A PROFESSIONAL ASSOCIATION GRAPPLES WITH CHANGE

Anne Forster, The University of Sydney

Introduction

Having identified myself as a distance educator for almost thirty years, it is uncomfortable to have to admit that I am now going through a crisis of identity. This could be a good thing. A crisis not only provokes angst it also provides an opportunity for reflection, questioning and evolution. What differentiates a distance educator now that the mainstream has adopted our practices? Why do I need to belong to a professional association focused on open and distance learning? How do I convince newcomers that it is not the technology, it is the personal that makes effective learning environments? Now that my specialist skills are absorbed in supporting the mainstream, how do I maintain a focus on the less privileged? And how do I reconcile the equally convincing arguments put forward here by authorities such as Hillary Perraton and Ross Paul?:

. . . there is an ideological case to be made for distance education in attacking educational inequality . . . and for attacking geographical as well as other forms of deprivation . . . But (my) concern (is) that arguments about the methods of distance education have been too narrowly based and that arguments about its legitimacy have been too self serving . . . Research on distance education belongs in the mainstream of educational research. (Perraton, 1995, p.20)

The danger, both for education in general and the field of distance education in particular, is that those most enamoured with new technology, who come almost exclusively from outside the domain of open learning, will dominate educational developments over the next decade – and that those who have so much to contribute, the distance education practitioners, will be passed over once again. Those of us in the latter category must ensure that this does not happen. (Paul, 1998, p. 21)

The tensions addressed by Perraton and Paul would appear to be recurring themes in the development of distance education, Holmberg (1986, 2001), Hawkrige (1976), Gough (1984). And the questions expressed in the opening paragraph, and the doubts they raise, are not mine alone. As the incoming president of the Open and Distance Learning Association of Australia (ODLAA) these were the questions put to me by members and by the executive who were grappling with the declining influence of the Association, and wondering if perhaps it was time to get with the strength and merge with the burgeoning associations focused on elearning and the use of computers and communication technology in teaching. Thus my own crisis of identity was one shared by the Association as a whole and put some impetus behind the need to explore the purpose of the Association, its membership and the processes and services it provides. ODLAA too was in its thirtieth year of service and it seemed timely to gather education, government and industry experts to discuss the issues and assist the executive in identifying the reasons behind the change in the Association's focus and to explore a strategy for future action. The new executive wanted to ensure that distance education practitioners were not passed over, and that distance education students would not be denied the support services that mitigate the impact of inequality, geography and other forms of deprivation not shared by those with the freedom to choose any mode of delivery. We also wanted to raise the profile of our research tool, the International Journal of Distance Education, as a product of the Association.

ODLAA's thirtieth anniversary invitational summit was held in December 2003. It was an exceptionally challenging and stimulating consultation process, provoking considerable reflection on a broad range of issues. How well we grapple with those issues will depend on our shared understanding of the role and purpose of the Association. It will depend on how well we engage with our members and put in place processes for their participation in breathing life back into their professional body. The purpose of this deliberation is to support our members by improving the quality of the learning they experience in their professional development, and in turn for them to influence the quality of support for the learners who

participate in open and distance learning to attain their goals. This paper is an examination of the role of a professional association in open and distance learning and the new forms of organisation and processes emerging with the new tools for knowledge creation and sharing. Do the emerging economies of teaching and learning within education generally provide a model for how the Association might evolve its services and the ways it engages with its membership? Can we practice what we preach?

The Professional Association as a Learning Organisation

Professional associations vary in their mandate. In some professional fields, registration requirements are legislated and the peak professional association manages accreditation guidelines and processes that influence curriculum and course structure, and determine whether graduates are eligible to practise in the profession they have studied.

The Australian Council of Professions defines a profession as:

... “a disciplined group of individuals who adhere to ethical standards and uphold themselves to, and are accepted by the public as possessing special knowledge and skills in a widely recognized body of learning derived from research, education and training at a high level, and who are prepared to exercise this knowledge and these skills in the interest of others”. (Australian Council of Professions, AGM, 1997)

Law and medicine led the professionalism process, with areas such as accountancy, engineering and architecture relative newcomers. The social sciences, including education have tended to organize as self-nominating academies with less emphasis on registration to practise. The commonly expressed purposes of a professional association are the promotion of the profession itself through advancement of knowledge in the field, promotion of professionalism among practitioners and the protection of consumers. Some professional bodies take their self regulation role quite seriously and may set standards and guidelines for qualifications, require a continuous program of professional development and adherence to a code of ethics and thus need to maintain a monitoring process with associated disciplinary procedures.

In a cursory exploration of the many organizations identified with open and distance learning worldwide it would appear that they do not take on these more formal roles. The Distance Education Clearinghouse of the University of Wisconsin-Extension lists forty public, private, non-profit and commercial organizations and associations relating to distance education worldwide (<http://www.uwex.edu/disted/assoc.html>). The Commonwealth of Learning lists a further twenty five associations not found on the UWEX site reflecting its relationship with a broader international field and with practice in developing countries (<http://www.col.org/resources/weblinks/associations.htm>). In addition to local organizations, there are a number of national and international umbrella organizations that manage a network of associations with a shared interest. The Commonwealth of Learning, based in Vancouver, has established the Federation of Commonwealth ODL Associations, FOCODLA. The European Distance and E-Learning Network (EDEN) runs a network for the ODL community in Europe through its European ODL Liaison Committee. The United States Distance Learning Association has established State Chapters and International partnerships. The International Council for Distance Education (ICDE), with a long established secretariat in Norway, has been the world's leading umbrella organization, managing a biennial conference and maintaining significant information resources through its partnerships, particularly with the Open University in the UK.

The United States Distance Learning Association (USDLA), (<http://www.usdla.org>), describes itself as the “leading organization developing, promoting and supporting the distance learning industry” (www.usdla.org). The USDLA convenes national policy forums, provides resources and represents members before government and regulatory bodies. It operates a network of State Chapters and is increasingly active in partnerships with international associations.

The USDLA lists its goals as:

- To provide national leadership in the field of distance learning
- To advocate and promote the use of distance learning

- To provide current information on distance learning
- To represent the distance learning community before government policy and regulatory bodies
- To serve and support the state, consortium and individual organizations that belong to USDLA
- To provide annual recognition and awards of outstanding achievements in distance learning
- To serve as a catalyst for the formation of partnerships among education, business, healthcare and government
- To achieve a global leadership role through liaison with international organizations
- To promote equity and access to lifelong learning through distance learning
- To promote diversity in our organisation and its programs.

The Canadian Association for Distance Education (CADE) describes itself as a national association of professionals committed to excellence in the provision of distance education in Canada. In addition to publishing a refereed journal, managing special interest groups, professional development services and general publications CADE conducts an annual conference. On its web site (www.cade-aced.org.ca) CADE lists its aims and objectives as:

- To advance and promote distance education generally
- To promote research into distance education theory and practice
- To provide membership services including professional development
- To provide a forum for interaction on a national, regional provincial and local basis
- To represent Canada internationally in distance education; and
- To promote access to learning at a distance

There is a common language used in these mission statements and a reasonably articulated shared set of principles. However all associations in ODL are conscious of the evolution taking place in education and training generally and many are undergoing considerable self examination to clarify their purpose and to differentiate their activities within the explosion of new communities emerging with a focus on learning technologies and the virtual campus. With the broad adoption of ODL approaches generally, the large professional associations within mainstream education and training have also undergone an epiphany of sorts, evolving their processes and services to reflect new communities of practice.

The American Society for Training and Development (ASTD) for example, has over 70,000 members. Established in 1944, ASTD is celebrating sixty years as the peak professional association for workplace learning and performance professionals. It has embraced distance learning and new methods of delivery evidenced within a manifesto (January 2002) that illustrates their vision, *Leading the Learning Revolution: a Manifesto for the Whole Community of Learning and Performance Professionals?*:

“We are daring to overturn our own paradigms. It’s not how much you invest in learning and performance improvement, but how strategically you do it. It is not how pure the pedagogy, but how quickly you can move a workforce to demonstrate competence. It’s not how well managed the change, but how much innovation you can inspire. It’s not how flashy the technology, but how well it serves learning and performance needs. And for many, there’s the tough paradox of wanting to have both old and new.” (http://www.astd.com/ASTD/About_ASTD/manifesto.htm)

Practitioners in open and distance learning find themselves immersed in a sea of alternative elearning organizations, many emerging rapidly in response to seemingly new fields of application. The competitive environment includes hundreds of organizations such as:

- ALT, the Association for Learning Technology
- EduCAUSE
- The British Learning Association
- E-Learning Network
- elearning Alliance
- Eifel, European Institute for e-learning
- Prometheus

Newcomers to elearning are mostly focused, if not obsessed with, acquiring mastery of the tools. They are also, for the most part, working in the mainstream, in classroom-based environments where distance education approaches are an option in a range of enhancements to enrich and provide more flexibility for the already well served. As Perraton observed above, distance education has much to contribute to the methodology, with the implication that distance education research must be applied to the mainstream in order to have influence. These organizations provide significant professional development alternatives and focused communities of practice engaged with the implications of electronic communications, knowledge management tools and standards. They are not alternatives to ODL associations – they tackle the tools of the trade, not the philosophy of approach. The differentiation comes down to three principles.

Open and distance learning focuses on:

1. *Learning*. Learning that takes place with a mix of independent and supported modes of delivery. Our concerns are for the learner, the learning environment and the systems supporting interactive learning; Daniel and Marquis (1979)
2. *Access, equivalence and excellence*. Our practices are designed to enable participation in lifelong learning for all. We aim to optimize learning effectiveness in all modes of delivery and gain parity of esteem based on learning outcomes. We strive for excellence by assuring quality in all aspects of our professional practice. Gough (1984)
3. *Collaboration and team based approaches*. As practitioners and researchers we recognize the value of collaboration and team based approaches to achieve the highest quality learning outcomes for individuals seeking opportunities for education and training in every sector and at any age. Holmberg (2001)

So the question that remains has to do with the role of the ODL community in supporting the three principles listed above. Has the recent failure of parent communities, such as the ODL community, to attract newcomers been simply one of communication and poor marketing. Is it because the experience in ODL has been largely forged on the periphery and thus too easily left there? The image conveyed through the ODL language associated with removing barriers for non-participants, and meeting the needs of those suffering forms of educational “deprivation” has perhaps failed to appeal to newcomers as relevant when they are seeking engagement with the media-rich and commercial end of town. Or is it that the knowledge society is challenging all of us, that we need to find new ways of generating support for each other as we surf this psycho-social tsunami of an information explosion?

Some ODL associations have begun to tackle these issues. The European Distance and E-Learning Network (EDEN) (<http://www.eden.bme.hu>) for example, has articulated a new image reflected in its recent name change (formerly the European Distance Education Network) and in its stated policy approach (Wagner 2003) as

- a facilitator for transnational cooperation, exchange and business;
- a knowledge and professional community;
- a hub-organization and a leader in a network-of-networks; and a
- European organization with a global view.

Going further, the Canadian Association for Distance Education conducted a national consultation, with funding support from the Office of Learning Technologies – Human Resources Development Canada over 2001 to 2003. The research aimed at identifying current practices and potential future directions for CADE (CADE 2003). On the whole the outcomes were consistent with the goal statements of the associations listed above, but with two significant enhancements, the exhortation to “act as a distance education certification body for the country” and to implement a National Institute of Distance and Distributed Education Advancement (IDEA).

The following statement encapsulates the beachhead position that CADE has attained in ensuring that its distance education practitioners and researchers will not be passed over in the swarming of emerging technology-led communities of practice:

With the ever increasing capabilities of technology and telecommunications it is acknowledged both nationally and internationally that distance education in all its forms (distributed learning, e-learning, resource-based learning) as stand-alone applications, or as part of its integration into mainstream institutions, is on the rise. Governments, institutions and practitioners are grappling with issues of policy and practice in this emerging and fragmented area. Canada is a world leader in distance education. By establishing IDEA/IPED, CADE-ACED is providing a vehicle nationally for governments and organizations to gain access to this expertise. IDEA/IPED could also work to represent Canadian distance education expertise to international organizations. CADE (2003) Appendix C

These developments in CADE and EDEN demonstrate the imperative for professional associations to recognize that they need also to be learning organizations. Starkey (1996) defines the 'learning organization as a metaphor, "with its roots in the vision of and the search for a strategy to promote individual self-development within a continuously self-transforming organization" (p.2). For an organization to be self-transforming it requires certain pre-conditions for learning to be met in relation to its leadership, structure and management processes. Only then can it "integrate the sum of individuals' learning to create a whole that is greater than the sum of its parts" (ibid, p2). The dilemma facing ODL associations is that they are on the whole voluntary, with loose organizational structures and a revolving door leadership resulting from an elected executive. While, some would argue that stability comes with size and the resources to establish an administrative and executive core to provide continuity and operational effectiveness, it is more important to inspire allegiance through identity with a shared vision. A well-resourced secretariat can be the seeds of bureaucratization, inflexibility and institutionalization, resulting in administrators who have a vested interest in the operations and are not active practitioners with a finger on the pulse of change.

Differentiating learning communities, in service for all

Developing countries have the highest numbers of learners currently participating in distance education and the fastest growing demand for access to education and training. The Commonwealth of Learning, UNESCO, national aid agencies and financial organisations such as the World Bank and the Asian Development Bank dedicate their services to alleviating poverty, building capacity and improving health through investment and support of distance education. Certain institutions and individual distance education practitioners have provided consultancy services but what role have ODL Professional Associations played in contributing their expertise to the development agenda through member professional development support and services? How active are special interest groups in this area? Mission statements include reference to access and equity, but these are generally applied within the national context. Perraton, in the aforementioned quote, alludes to the "ideological case to be made for distance education" in addressing issues of deprivation. But is it more than an ideological case? Could it be that as professionals, privileged with expertise and knowledge, we have an ethical responsibility to apply ourselves in the service of all, and not just to our local interests, but to embrace our global community?

In establishing the Federation of Commonwealth ODL Associations, FOCODLA (<http://www.col.org.ca>), the Commonwealth of Learning, sought to encourage networking and connectivity between the ODL associations of the Commonwealth specifically to:

- Act as a vehicle for collegiality for ODL (professional association) development, benefit and sustainability;
- To assist new and emerging associations becoming viable and effective;
- To help member associations build on each other's strengths and experiences;
- To provide opportunities for professional collaboration in research, intellectual debate and ODL implementation strategies;
- To facilitate the exchange of good practice and close co-operation between the association members, to encourage new professional development especially in the domain of technology-based ODL in general;
- To encourage and assist members in the elaboration of collaborative projects, and in seeking adequate sponsorship for such projects;

- To provide advice to COL including priorities for funding and identification of trans-national activities for support by COL; and
- To organize a biennial Pan-Commonwealth Forum

FOCODLA is a critical agency, but appears to be withering on the vine through lack of active engagement. The Pan-Commonwealth Forum attracts over six hundred delegates, mostly from developing countries. The contribution of “mainstream” distance education researchers has been restricted to the few, and has diminished, as has the active participation of delegates from digitally rich distance education environments (we nevertheless, have pockets in our own countries of development and poverty with learners facing equivalent hardship arising from ethnicity and class). Are we now so self serving that we have allowed ourselves to focus exclusively on contributing to the mainstream and riding the elitist wave ascribed to those with expertise in elearning and neglecting the rights of the under-served? Should we let the mainstream take care of itself and get back to solving real problems for learners who lack basic support?

With these considerations in mind, the ODLAA executive planned the Summit meeting as an opportunity to consult broadly but selectively, with educational experts who would both challenge our assumptions and irritate for change.

Designing the ODLAA Summit

The invitation to attend the summit was extended to twenty seven individuals who were the key decision makers and chief executives of organizations known for innovation in education and training, policy making and provision in key sectors, including ODL in Australia. While effort was made to balance the meeting across all sectors and to include industry and government, the constraints of numbers and timing led to some omissions, most regrettably, direct student and transnational representation. The meeting was restricted to one full day in Sydney with participants generously meeting their own costs. With the ten members of the ODLAA executive the participants included senior executives from:

Industry: Telstra, MicroSoft Pty Ltd, NextEd, Open Learning Australia, ACL Pty Ltd, IDP Education Australia, Education.Au Ltd, AEShareNet Pty Ltd, private consultants.

Schools: Open Access College.

Vocational Education: Open Training and Education Network; Flexible Learning Leaders Project; Queensland Open Learning Institute.

Universities: Deakin, South Australia, Sydney, UTS, Monash, UNSW@ADFA, Canberra, Charles Sturt, Southern Queensland, Macquarie, and New England.

Government: Queensland Department of Employment and Training, Commonwealth Department of Education, Science and Technology, Australian Agency for International Development.

Professional Associations: APESMA (Association of Professional Engineers, Scientists and Managers of Australia), Australasian Council of Open and Distance Education, Transnational Education Directors Forum.

The program was designed to provide each invited participant an opportunity to present briefly on how the objectives of their organisation might be embraced within ODL, or on priorities faced by particular student communities. The day was launched with two prepared presentations, the first designed to position ODL within a global context of change. The second on the role of a professional association in ODL, its services and strategies for differentiation. Round table discussions were convened three times during the day. In conclusion, three individuals were asked to reflect on the days discussion and present feedback on the critical issues raised. Members of the ODLAA executive continued meeting the following day to explore the implications of the discussions and to draft a plan of action moving forward.

Outcomes of the discussions

For the purposes of this paper I have put forward only the key questions, the core “take-aways” from the day’s consultations.

Specific to ODLAA as a Professional Association

- ODL specialists need to advocate for positive change in education generally, to apply our skills on behalf of all students, embrace the mainstream.
- First define the association’s topical space and identity, who is it serving, how can it focus its services and what processes will deliver leadership and interactions to maintain relevance.
- Who needs to be in this community of practice, what is the boundary of the “topic of passion” and what are the strategies for communicating the knowledge we have?
- The changing nature of demand is leading to disaggregation involving multiple players in the value chain. ODLAA needs to provide professional development and leadership in assisting providers in understanding and working with emerging business models.
- Need to facilitate knowledge sharing and critique within the professional community of practice, requires interaction of knowledge and action.
- Need to influence new business models for organisations generally, apply the ODL systems approach, market orientation and project skills.
- Opportunity to exercise leadership, to build the community of practice

Youth and the future

- The growth area in the schools sector is with learners who are alienated from the traditional structures and with learners suffering from depression and mental illness. The politically sexy overtones of e-learning distracts from the core needs for professional development of teachers.
- The future for ODL will be with the ‘net generation’, those who value free expression, collaboration and networking to achieve. ODL will need to meet their demands for learning tools that invite interaction and co-production. They will demand more team learning and assessment, more integration with work place projects. They will want really short chunks of learning delivered through wireless, hand-held devices.
- Performance Support, Knowledge Management and Gameplay will dominate pedagogical design, with the need to focus learning environments according to the skills of “digital immigrants” and “digital natives”.
- Students need guidance to improve their navigation and evaluation of web based resources as well as instruction on conducting effective and scholarly searches

Emerging markets and marketing analysis

- The customer in ODL is not just the learner, but includes teachers, administrators, industry and society as a whole.
- What impact has ODL had on Australia’s education market and what is the growth rate relative to conventional delivery?
- Take a demand driven approach, determine the true competitive advantage of ODL and communicate its benefits to target markets.
- Distributed offshore delivery growing at 30 – 40%, with networks of learning centres
- Emerging, leading edge initiatives occurring in professional post-graduate education
- A focus on access, equity and development will impede growth of a competitive industry
- Key vocational education and training issues relate to learning pathways and the implementation of tracking processes using customer relationship management systems.
- We need more data on outcomes for particular industry groups, benchmarking and identification of best practices.

Development and Transnational

- What role can ODLAA play in Australia's development agenda particularly in the East Asia and Pacific region? Current development projects struggling to find content and providers.
- Transnational education demands market intelligence, a database of expertise and consultants, quality guidelines. Could ODLAA provide a "one stop shop" of resources and advice? It is certainly needed.
- In the delivery of English language programs, the international client is an institution not an individual.
- Transnational education is about interactions between cultures with students from non-English speaking backgrounds.

Improving quality

- Investment in education here is allowing Australia to "slip through the statistics". We are losing ground internationally, our products are becoming non-competitive, mainly because we are not adapting products designed for our local market. ODLAA needs to provide access to examples of good practice.
- The infrastructure and support services for rural and remote students are being duplicated by individual providers as a source of competitive advantage. No one wins and access is diminishing.
- Government will be investing heavily in technology as infrastructure, not particular modes of delivery, to enable more entrepreneurial autonomy.
- Educational institutions no longer control access to the information used by students, security and costs will inhibit scholarship.
- Librarians can and do play a counselling role in addition to their academic support role in their interactions with distance students. They assist in creating a positive learning environment which reflects well in the student's experience of the institution generally.

The above set of issues, requirements, and proposed actions represent but a small part of the universe of change that the Association must grapple with. The day following the consultations was spent by the executive in sifting through the key issues and nominating specific areas to initiate action. It became clear however, that this represented a huge agenda. We first had to clarify our purpose, identify the boundaries of the "topic of passion", and re-establish ODLAA as a community of practice.

The Professional Association as a Collective of Communities of Practice

The concept of "community of practice" had come up repeatedly during discussions. Wenger's (1998) framework for communities of practice is based on a social theory of learning; learning as experience - meaning; learning as doing - practice; learning as belonging - community and learning as becoming - identity. He places the focus for rethinking learning on participation. In transposing Wenger's participatory framework: to the community building of our professional association it means that

- Individually, we need to engage and contribute to the practices of the profession, a "mutual engagement"
- As communities, we must seek to question, critique and refine our practices to ensure new generations of members, with "a shared repertoire" and as an
- Organisation, we must sustain the interconnectedness of the many communities within our collective, a "joint enterprise", "through which an organisation knows what it knows and thus becomes effective and valuable as an organisation" p.8.

It is clear that the process ahead, as we pursue the practice of our profession, participate in our communities of practice and seek coherence for our activities and services as a collective of communities, or like EDEN, a network of networks, will depend on how well we develop our social relations. We are at the very beginning of this journey with the comforting knowledge that we are not alone, and that some of our fellow ODL associations are further down the path.

Conclusion

Holmberg opened his book on the Growth and Structure of Distance Education (1986) with ‘*Plus ca change, plus c’est la meme chose*’ and closed it with ‘*It is difficult to imagine a future in which distance education will be de trop*’. In that book, Holmberg recognized the blurring of distinction by the use of distance teaching methods on campus, but he reiterated that the needs of distance students for special study support would have to be met by “*suitable methods, media, administrative procedures and organizational patterns.*” The challenge for ODL practitioners is to maintain the distinction of practices needed for supporting distance education students whether they are on or off campus, all or part of the time, using whatever tools of communication and learning that become available. Our professional responsibility is to seek to improve the learning experience and learning outcomes of all learners, including our members and ourselves.

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Author:

Anne Forster, Director Innovation and Technology in Education Ventures and
Manager Special Projects
Office of the Vice-Chancellor and Principal
The University of Sydney, NSW, 2006, Australia
a.forster@vcc.usyd.edu.au

THE HUMAN SIDE OF DISTANCE EDUCATION MANAGEMENT

Lucy C. Morse, University of Central Florida

Abstract

Within distance education many times it appears that the only system of significance or interest to many administrators and faculty is what classes are being presented, the style of teaching, web design, and the course production. There is a need for this information and the different types of training for faculty and staff, but the human side of the management of distance education has been largely ignored. Attention has been focused on a multitude of other issues, rather than on the human side, which is important during this transition time for distance education. The process of distance education includes the development of the program infrastructure to support distance education. The infrastructure includes course inquiries, advisement, scheduling, marketing/sales, production, logistics, support personnel, testing, and evaluation. All of these processes are systemically interrelated and interdependent and are based on a foundation of institutional support and they help to create a meaningful learning environment.

Background

The human side of distance education management is a necessary component of distance education. The fundamental definition of distance education is: any learning setting where the instructor and the students are physically separated; therefore, distance education includes distance teaching and distance learning. [1] Since there are many technologies that support distance education, a distance education technology continuum is considered in this paper. The continuum has correspondence courses anchoring the low technology end of the spectrum and video-streaming courses anchoring the high technology end.

The process of distance education is the development of the program infrastructure to support distance education. This infrastructure includes training faculty and establishing access for the learner. Before the process is considered, the following questions need to be addressed by an institution before making a commitment to distance education:

- Is the institution interested in pursuing a distance education path in addition to a traditional college student path?
- Who are the customers or potential users?
- What are the programs/disciplines that faculty and students believe need a distance education option?
- Are the programs selected suitable for distance education?
- Is the purpose of distance education to make the institution more accessible for the current customers or to attract new customers?

Knowing the answers to the above questions enables the activities for distance education to then be integrated into one system. The first tasks that the administration needs to adopt then are the technology infrastructure and the operations management. According to Bates [2] technology infrastructure has two main elements – physical infrastructure and the human support for the infrastructure.

The physical infrastructure includes the hardware, servers, networks, Internet connections for all, and continuous upgrades. The human support includes the technology support staff, educational technology support staff, the instructional design staff, and the human support of the student. In considering distance education then, three components are apparent: technical (hardware, software),

the academic (course design), and the process or the human side of distance education. This paper is concerned with the human support of the student. Often at this point the administration stops their institutional support and the colleges and departments must continue.

The video series, *Beyond Chalk: Teaching with Technology* [3] and *Reach Out and Teach: Designing Distance Education* [1], present what many distance education administrators and faculty consider the only system of significance, the academic portion: what classes are being presented, the style of teaching, web design, and the course production. There is a need for this information and the different types of training for faculty and staff, but the human side of distance education management has been largely ignored. Attention has been focused on a multitude of other issues, rather than the human resource management, which is important during this transition time for distance education. The operations system can be thought of as having three major parts: inputs, processes, and outputs. The inputs to the distance education operations system are tangible as faculty or intangible as information and time. The outputs from a distance education operations system are either intangible as satisfied students (customers) or tangible as courses delivered to students and a final degree. The processes are the essence of the operations system. They deal with the transformation of inputs into outputs. The outputs of the operations system result from the transformation of the inputs by the processes, which are performed by the academic and the human side of distance education management. The process involved in distance education is the development of the program infrastructure to support distance education.

Thus far, the inputs and outputs of operations management have been addressed. Now an overview of the human side of student support of distance education management is considered. The infrastructure includes course inquiries, advisement, scheduling, marketing/sales, production, logistics, support personnel, testing, and evaluation. All of these human resource processes are systemically interrelated and interdependent and are based on the foundation of institutional support and they help to create a meaningful learning environment for the student.

Inquiries

Once the potential students learn about the distance education program inquiries begin. Since distance education degree or certificate programs in most institutions are departmental, rather than institutional, the department has an additional role. These inquiries may be made by electronic mail, telephone, or letter. A process must be in place to handle these inquiries in a timely fashion. The method of response to each type of inquiry will vary according to the method of inquiry. Since these students will be using the Internet for their education, a postcard or a web paragraph may be used. In the beginning, especially, students need to know the admission deadlines, when the semester begins, how to register for classes, and how many courses do they need to take for a degree. This information is easily put on a web site and updated regularly. To follow through with these inquiries a database needs to be set in place with the name, address, e-mail address, date of contact, and comments. This database will allow for follow-up by the department.

Advisement

When the student begins to consider the distance education program, they will need advisement. Since many of these students are not from the same or local schools, they have a variety of courses and backgrounds they would like accepted into a program of study. Thus advisement can be labor intensive and one-on-one, but there are ways to minimize the efforts. One, a plan of study for the student is completed up front. Many students will never see your campus and need to be assured that they may complete a degree or certificate program at a distance at your institution. A dedicated advisor for distance students is recommended.

Scheduling

Scheduling courses with a degree or a certificate as an outcome is important. The order of scheduling courses within a major is more important for some options. Pre-requisite courses need to be offered during the year before a follow-up course is offered. Courses need to be rotated to handle a variety of student schedules. It is important for distance students to have easy access to this information at all times.

Marketing/Sales

There are successful techniques to market and sell the distance education program locally, nationally, and internationally. First, the target audience needs to be determined, and then where this target audience is located. How to market to each target group is the next step. For example, in engineering technology at the University of Central Florida there are three target groups: high school students, community college students, and persons currently in the work force. A different technique is used for each of these three groups.

One of the marketing tools and, subsequently, a support for the learner is a web site. For an example see <http://www.ent.ucf.edu>. This web site gives all the information about degree/certificate programs a distance learner or traditional learner needs.

Production

Whether the delivery is correspondence, video, or on-line, the faculty member is key for communication, interactivity with the students, and removing obstacles for the student's learning. Faculties need to remember that good instruction is more important than the delivery medium used. The course subject matter, not the technology, determines the course design. A well-designed distance education course focuses on good instructional principles. Richard Clark [4] has stated that media are mere vehicles that deliver instruction but do not influence learning under any conditions. The delivery system is the pipeline for presenting the instruction and good instruction can be designed for any delivery system.

Course developers must be aware of the delivery technologies, the instructional design, and the organizational and management requirements that go along with providing a course at a distance. One of the main responsibilities of the instructor is to serve as the content expert. The educator will determine the direction of the course and may operate as the course project manager during course development.

Production characteristics as given in the *Online Teaching Guide* are the following:

- Interaction and feedback. Online students learn through active engagement with faculty and other students. Online learners need to know if their ideas and responses are productive.
- Learner control. With their busy schedules and work and family responsibilities, online students need to be able to stop at any time and to reenter at their convenience. Asynchronous learning offers more choice of where and, above all, when students access learning.
- Directions and help. Online learners require access to guidance. Instructors, other students, and software should prompt learners step by step through difficult information. A web course platform assists with this guidance and help. An example of a platform is WebCT, which is internationally used and was developed in 1997 by the University of British Columbia.
- Consistency and organization. Explicit and consistent organization increases the retention of new material. Summaries, interaction, and feedback should organize and provide a synopsis of the material presented.
- Assessment and record keeping. A tracking system should inform online learner of the materials and activities they need to review before proceeding. [5]

One of the production characteristics is interaction. Students are used to being passive viewers of instruction. To encourage learning, approaches to get students actively involved in the class must be designed into the instruction. This is more important for distance learning, rather than traditional courses. Some of the interaction techniques that may be included with course materials are: [6]

- Electronic mail
- World Wide Web
- Delphi Process
- E-teams [7]

- World Wide Web Forum discussions
- Journals
- Scavenger hunt

Logistics

Administrators must plan the logistics of the course and prepare for contingencies in the event that something goes wrong. In a distance education course, there are more logistical factors that must be addressed than when planning other types of instruction. These can include such things as communication strategies, policies and procedures, staff training, and course delivery systems. There are more things that can go awry because students and teachers are not in the same location.

Support Personnel

Support Personnel are the glue that hold the operations together. Management and personnel factors need to be considered when analyzing a course for distance education. The logistical requirements, as seen above, are much more involved than those found in traditional instruction. When planning a distance education program, there is also a need for more support personnel. Not only do the students have to learn how to operate the equipment, but so does the instructor to some extent, and the site facilitators and/or technicians. This support is considered as a part of the technical infrastructure offered by the institution.

Within the Engineering Technology department these additional support duties are required because of the distance education offerings. As an example, some of their responsibilities are listed below.

- Director
 - Administrator
 - Oversee operations management
 - Liaison for establishing contacts
 - Legal issues
 - Promotion market
- Administrative Assistant
 - Budget and all that the program assistant does
 - Supervisor of distance personnel
 - Scheduling of courses
 - Copyright issues of faculty material
 - Work with advisor
 - Registration process
 - Assist director
 - Coordinate with institution distance program
- Webmaster – part time
 - Course materials on the web
 - Maintain site
 - Faculty web support
- Program Assistant – part time
 - Inquiries and follow up
 - Complaints
 - Send advertisements
 - Distribute exams

Testing

Testing is a dilemma for distance education. Online testing may be used, or if the students are not very distant, they may be required to come to campus for the exams. Online testing is not secure at this time. Proctors are used by many programs and academic honesty may be easier to achieve with the

proctors. Usually for distance students there is a lag time to take the exam and then a lag time for the return of the exam. This creates a problem for many faculty accustomed to traditional teaching and immediate return of exams.

Evaluation

Since distance education is in transition, evaluations of the process are essential. The evaluation can assess the course, its contents, availability of the instructor, online software features, testing methods, and interaction procedures.

A system that allows distance learning to successfully function in higher education is needed for the customer/learner. Currently the human side of distance education management in the traditional university is inadequate to meet the needs of customers/learners at a distance. For these customers to succeed they need more than the freedom of controlling the time and place of their education, they need the support services available to traditional students.

Appropriate operations management processes are essential for distance education. These processes are in addition to the technology infrastructure provided by the institution. The human side of distance education management has to serve both administrative and academic needs. The implementation of these operations management processes will require change in the way departments and institutions are organized and managed. They will affect the nature of the work of faculty members, and above all will affect the relationship between teachers and learners, both traditional and distance.

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Author

Dr. Lucy Morse
University of Central Florida
Engineering Technology
Box 162450
Orlando, FL 32816-2450 USA
morse@mail.ucf.edu

REINTELLECTUALISING A DELIVERY ORGANISATION: THE NATIONAL EXTENSION COLLEGE IN THE UK

Alison West, National Extension College

Introduction

The National Extension College in the UK has been in operation as a distance education provider for 40 years. It was established by a social entrepreneur, Michael Young, with an explicit ideology of redressing disadvantage by providing educational opportunities for those unable for a variety of reasons to be educated by the traditional establishments in the UK. Set up as a precursor to the Open University, over the years the College has offered over 120 courses each year to a wide range of distance, open, blended and e-learning students. With between 10,000 and 20,000 students enrolled at any one time and with materials used by a further 75,000 the College has a wide range of data collected. It has also, over the years, run various experimental courses with valuable information collected on issues such as student retention. The bulk of NEC students are those seeking traditional educational qualifications and as a service delivery organisation, this is what NEC has offered, using innovative methods.

Despite the date of its establishment, 1963, there was no particular radicalism in the underlying pedagogy. The assumptions were in line with those of traditional face-to-face educational providers. These included an acceptance that what counts as significant knowledge would be agreed centrally by a complex of acknowledged experts from academe, from the teaching profession, from the Inspectorate, from central government, from examining boards and from publishers. The NEC's concern was in effect to mimic this system by producing material and organising tutor support based on the central production of 'significant' knowledge. While NEC did involve tutors in the process of packaging knowledge, this was in their role as experts in a particular subject and there were no collective inputs either to production or to the underlying pedagogy. Students have had no involvement in the form of the curriculum, which for accredited courses is shaped by external awarding bodies, themselves strongly controlled by central government. Nor have students been able to affect the method of transmission, or teaching styles. In many ways, NEC has operated within the Fordist model, with a central unit producing the goods, educational courses carefully designed and packaged, and marketing units selling these as products to the general public. It would however be fair to say that NEC was a pioneer in the way knowledge could be adapted for distance delivery methods, using new methods of learning design which made complex knowledge accessible to less confident students. NEC worked on chunking and modularisation long before the concept of learning objects became fashionable and by the 1980s it was introducing its authors to learner-centred pedagogy. High quality course material has remained a feature of NEC across its history. NEC also developed innovative delivery methods for the traditional curriculum, including partnerships with other media: for example it linked up with a regional TV station to run a popular Easy Maths television series with a linked distance learning course. For many generations of students unable to attend traditional providers, NEC has indeed fulfilled its original remit as an alternative route into the educational system. Many students complete their education with the NEC, often remaining with it for several years. Others move on to face-to-face providers if their personal circumstances change or if they have attained the required entry qualifications. Since its inception, NEC has located itself firmly within the conventional educational system. This is a key value for the students themselves: they are often anxious to attain recognised qualifications given the unusual study method adopted.

The failure of radical pedagogy

In remaining in line with the whole of the UK education system, NEC stayed with 19th Century norms following the failure of radical pedagogic theorists and polemicists in the 1960s and early 1970s. These radicals failed to bring about fundamental change in the traditional educational system. NEC, with a

surface radicalism for its time, was in fact well placed to seize the opportunities opened up by, for example, deschoolers like Postman and Weingartner. A large proportion of its students are in their own way 'deschoolers', with home study students, prisoners, people with disabilities, single parents, and carers featuring heavily. The opportunity was there to devise co-operatively more appropriate curricula for their needs and the NEC could have been a substantial agent of change. Under its own menu system, offering a range of courses, to some extent this student control happened and continues to happen. For example, a recent programme run by NEC offered those with disability and those caring for others a choice of educational opportunities and students chose packages of study (pre-prepared as are all NEC courses) to fit their own needs. Clear categories emerged: some students sought courses that would enable them to cope with their current life circumstances, including counselling skills and coping with stress. Others sought supportive and pleasurable forms of education, including creative writing. Another group of students aspired to return to work in the future and were more oriented to job-related qualifications. Within a menu system, therefore, there is some space for the student construction of the package, but not of the content and form of its individual components.

NEC, again in line with more traditional providers, did try in some stages of its history to work with excluded groups in an enabling and empowering way, producing work with Asian women and Vietnamese immigrants to the UK. The growth of community education in the UK during the 1960s and 1970s paralleled the golden age of community development and, as Marj Mayo and David Jones demonstrated in their *Community Work* series of books, professional workers were able to broker the development in poorer communities of alternative education provision and alternative constructions of knowledge. Resource centres were set up in poorer neighbourhoods to give advice and develop skills. The People's History movement flourished, providing a new type of history more appropriate to the real condition of people's lives. The links between communities and trade unions led to peer exchange of knowledge, particularly around health and safety issues. A thriving community publishing movement, often co-operative in structure, led to the production of an alternative canon. Practitioners drew on a number of theoretical sources but the dominant theorist was Freire, whose writing on third world literacy was adapted and applied in disadvantaged UK neighbourhoods.

Despite efforts such as those of NEC, distance education was assumed in the UK at this time to be more suited to individual knowledge acquisition than to group use. There may even have been an assumption that learning individually was actually better than learning in a group, not an assumption operating in developing countries. In developing countries, the value of group learning using distance delivery forms was well recognised and part of the development movement. For whatever reason and despite some excellent courses and materials being produced for and with voluntary and community organisations, NEC remained primarily concerned with supporting the individual learner and on the whole did not maintain the alliances that would place that individual learner in a collective context. Reasons for the lack of change within NEC during this period included the latent nature of its own ideology, its early orientation towards service provision and the pressure to survive by generating its own income.

The change in the political climate in the UK in the 1980s and 1990s consolidated the conservatism of NEC and indeed of most educational providers. Student rebellions and questioning subsided, democratic gains were pulled back or sanitised and the community development movement came under attack as over-subversive and as in conflict with the interests of the local and national state. The 'discovery' of adult illiteracy in the mid 1970s led to changes in community education, which shifted from being the community's education system (and this in any case had always been marginal and under-funded) to being the placing of traditional, largely remedial, education in the community. One of the beneficial outcomes of the re-establishment of political Conservative hegemony and its associated individual consumer model was an opening up of physical establishments, as further and higher education broke with tradition and welcomed mature and part-time students. (Indeed this opening out has diminished the potential student base of both the NEC and the Open University as local institutions now offer flexible learning at home.) However the consumerist model was combined with a highly instrumental view of education as a path to social and economic mobility and interestingly this has continued through two Labour governments from 1997 on. Education as a given good did not feature in public policy and pressure on local government to show efficiency and value for money led to the age of the inspectorate and the dominance of measurable outputs, still a feature of UK education.

The lack of a consistent ideology and methodology

In this historical context, an organisation managing to remain largely unchanged should come as no surprise. The 40-year pattern that has emerged is of an organisation continuing with the same basic paradigm, of seeking effective ways to deliver a socially conformist form of education. It is fair to say that student surveys over the years have shown that NEC students themselves are attracted to the organisation largely because of this instrumental approach. This has not been monolithic: NEC has been careful to maintain within its range of courses those that could be described as life-enhancing, as education for education's sake. Nevertheless, the bulk of provision remains instrumental.

One value from stability is the accumulation of knowledge on how to deliver and manage large programmes of distance and open learning for a wide variety of students. NEC has not maximised the value of this legacy. Internally there is no clear theoretical base to the collection of information and, although research has taken place, NEC has not located itself in relation to academic schools of thought. The lack of a consistent methodology along with the lack of an underlying theoretical base has an effect on data collection: standardisation was not instituted and comparative analysis is therefore difficult. Good research and evaluation has taken place and the results have been influential both in the organisation and in the wider educational world NEC operates in. However, such ad hoc reports are seldom linked to each other and in addition longitudinal studies have not taken place. Those wishing to study the long-term impact of distance learning had in NEC a ready-made cohort for study but NEC has not sought to be an object of study in itself.

In defence of NEC, it was established as a service delivery agency, not as a research or policy organisation and, in common with many similar agencies, the pressures of service delivery have pushed internal intellectual processes to the margins. NEC receives no state aid and although it is an educational charity it receives few donations to support its work. Its role as a factory system is therefore partly economic. It has also continued through the years to maintain intellectual rigour at a micro level, with ground-breaking work on print-based learning design. There would be no shame in NEC continuing to be simply a conservative (and conservative is not used negatively) factory system since in any social system the bulk of provision must of necessity conform to social norms. However, NEC is an organisation that has remained surprisingly influenced over its 40-year life by the idealism, of redressing disadvantage, associated with the time of its founding. As a result there remains a disjunction between the aspirations of Trustees and staff and the reality of production of accepted knowledge. NEC's idealism attracts key staff who see NEC as an agent of social progress. It is not likely to operate as such unless its internal systems are examined and subject to change. In particular it has to examine the way it articulates, packages and disseminates knowledge and who participates in this process.

Reviving idealism and developing systems from ideology

A re-evaluation of the underlying educational theory of the organisation is timely both for internal reasons and because of the interesting and still emerging debate, impelled by technological change, about the nature of teaching and the nature of knowledge validation. The educational establishment has over the years been subject to technical fashions, moving from blackboards to overhead projectors and so on. The speed and nature of the changes brought about by new technology have, however, generated far more fundamental debate. This is rapidly spreading into knowledge construction theory, the underlying base that is largely unquestioned by most day-to-day teaching establishments who do not in themselves produce material.

Market pressures to develop e-learning content are creating a re-examination of the organisation's way of working. Specifically, and in common with many UK providers of both distance and institution-based learning, the very nature of teaching is coming under examination. The technical need to "chunk" learning is leading the organisation into a robust debate on the limits to the modularisation of learning. As Norm Friesen observes, standardised learning objects may suit technical applications but are inadequate for what one might describe as 'education' in the liberal humanist tradition. The debate is not merely about the packaging of knowledge: the dissemination method, with increasing use of the Internet, is provoking a more radical reassessment of the very formulation of accepted knowledge itself. In coping with this, the organisation lacks co-ordinated structures. NEC is therefore not adapting

existing internal systems but setting up new organisational systems in effect to allow pedagogic discussion and analysis in a service delivery organisation. Having to set up systems does allow a freshness of approach that suits a time of change. NEC's new organisational approach will be to create and combine four main communities of learning to inform future developments.

First of all, there are the 15 Trustees who govern the organisation. Trustees in the main come from policy and educational backgrounds and are committed to an organisation with progressive social goals. While wishing a well-run organisation that is financially stable, they also wish it to have social impact and to deliver 'good' education: the definition of good in this context is education that is both desired by and is valuable to the student. Trustees themselves accept that there will always be a balance, and at times a tension, between on the one hand giving students what they want, often a highly packaged access route to accepted qualifications, and on the other hand leading students to a widening of the mind. This belief in the value, and indeed the pleasure, of the widening of the mind is the thing that distinguishes education from training. In practical terms, Trustees have agreed to cancel one of their four business meetings a year and to use this space as a think-tank session to look at the underlying educational principles governing NEC and the way these should influence the practice of the organisation.

The second set of agents for change will be the 20-30 workers within NEC who are responsible for writing educational material, for producing it, and for linking it to the needs of both students and other providers. With backgrounds in educational theory and delivery, this is a group that has the capability to analyse the organisation's practice and to relocate it in pedagogical theory and in the wider social policy discussions that e-learning is impelling. A small strategic group has been established to analyse current practice and to look at new ways of working. Wider staff seminars will be held to ensure that all key staff can contribute.

The third group is the students. Their power to control not only their reception of pre-packaged knowledge but also the formulation and combination of such knowledge is increasing rapidly. This is because of new technology – the website allows a greater interchange of ideas but also gives the ability to record and analyse such ideas. NEC is establishing peer support and learning systems that can more effectively capture student knowledge than the face-to-face informal exchanges that characterise student systems in traditional institutions. Developing students into a force for change within NEC will take two forms. First of all, peer exchange and support systems have been established on the website in relation to the traditional subject divisions. This enables more effective learning in a conservative context. But more radically, it also enables students to comment on courses in both critical and supportive terms and over time to build up their own definitions of what it is valuable to learn.

The fourth group, essential to a learning institution, are the teachers themselves. Changes in the roles and thinking of Trustees, staff and students will in turn present major challenges of both theory and practice to the 200 - 300 tutors who teach NEC courses. At present they assist NEC in the construction of knowledge, and a tutor space, both course and subject specific, has been established on the website. Tutors have not traditionally been included in discussions about the ideology that underpins NEC practice and systems to draw in tutors, including seminars, training sessions and consultation are being established.

These four groups with an interest in NEC are very disparate but at heart they do have some common bonds: they are all interested in how knowledge is articulated, in how people learn and in the best ways of teaching people to learn.

A new paradigm

NEC seeks to set up systems that will allow the emergence of a new learning paradigm for distance education providers. This new paradigm is likely to be more radical than the existing norms informing NEC practice, and the organisation could begin by revisiting the educational debates of the 1970s deschooling movement. It is not too fanciful to posit the creation of a new republic of learners, one that will break down the traditional divisions between provider and recipient. Thomas Kuhn describes how difficult it is to change entrenched accepted knowledge, to shift the consensus around

‘appropriate’ learning. The existing canon of subjects, levels of knowledge, of assessment and grading is extremely fixed in the UK and not subject to change by those outside the charmed circle of controlling professionals. This system has hardly started to look at the long-term impact of peer/peer acknowledgement of knowledge let alone at ways of adapting or developing the canon in the light of what students themselves agree to be worth knowing. While this must be guesswork, it may be that we are already taking a quantum leap into a new paradigm of learning, as boundaries begin to blur. Paradigm shift needs both pioneers and broad acceptance and we can see that this is happening in economic and political areas other than education. The transnational alliances of radicals that seem, as in Seattle, to be in a phase of expansion are now being complemented by an invisible army of ordinary people increasingly in contact across nations using new technology and increasingly able to bypass the traditional gatekeepers of knowledge. The German boycott of Shell petrol showed how effective a combination of these two levels of organisation can be.

If paradigm social change is under way, can a relatively small national educational provider have a meaningful role to play? It can certainly set up systems to experiment, and to offer new models of knowledge validation. As a distance learning organisation, increasingly bringing students into the dialogue about useful knowledge, NEC is well positioned to do so. In part, NEC will of course retain its conservative orientation: it will continue its role as a service delivery agent, packaging and disseminating knowledge and carrying out teaching within the traditional educational system. Even in this continuing and essentially centralist model, it is assumed that peer learning and support systems will apply. Student views on courses will continue to be fed back to central agencies shaping the curriculum.

However, in addition, NEC will set up systems to allow a wider group of people, particularly students, to influence the formulation and updating of content and of curriculum, the system at present tightly controlled by professionals. Already, new technology allows learner groups to exchange knowledge and to agree by consensus what is to constitute knowledge. As Jason Frand observes, ‘in a file-sharing, cut-and-paste world, the distinctions between creator, owner, and consumer of information are fading. The operative assumption is often that if something is digital, it is everyone’s property’ (Frand 2000). Given NEC’s long history as a distance learning provider, itself increasingly using web-based delivery, and given its promotion of peer learning and support using IT, it will seek a role in helping to record and disseminate such consensus-knowledge. It aspires in future to be part of the construction of validated knowledge not as part of a centralised control system but as an agency that can assist the collaboration of a host of individual learners.

Implementation

If NEC is to expand its practice beyond the simple provision of centrally-generated and approved knowledge, the organisation will have to think this through carefully. In terms of implementation, there will be five stages:

- a) continuing high quality delivery of the accepted curriculum, largely packaged and validated centrally by the educational establishment
- b) developing good student-centred ways of succeeding with this centre-out curriculum, including peer support, and exchange of ideas through the web and through blended learning
- c) developing systems to question, challenge and improve the accepted curriculum. This will involve students, staff, tutors and Trustees collectively
- d) developing systems for influencing and changing (a) to include the input of students and other interested parties. This will require policy work
- e) setting up methods of validation for alternative curricula, devised by students themselves

The challenge facing NEC will be to operate these five stages in a co-ordinated way.

To give an example, NEC has a cohort of students studying Pre-school Practice, a course leading to a qualification validated by an external awarding body, CACHE, the Council for Awards in Children’s Care and Education. This is stage (a), where a number of people not previously known to each other sign

up individually for an advertised pre-packaged course with NEC. NEC students on this course maintain a lively dialogue about this course, exchanging information, offering comment and at times disagreeing with the course content. They do this mainly through the NEC website and this is stage (b). At present, stage (c) is restricted to the professional course writing and development staff inside NEC along with selected tutors, although of course they take account of student views. NEC plans to make this into a more equal dialogue with student views given greater prominence: students will be encouraged not simply to critique existing ways of presenting knowledge but also to work on the creation of new ways of organising knowledge or indeed of defining knowledge. At present, NEC operates at stage (d) by giving feedback to the professionals who control the curriculum and accreditation system for this subject and the plan again would be to bring learners into the process in a more structured and public way. More radically, a student-generated curriculum, as in stage (e), could emerge and either be adopted by the validating bodies or simply operate in parallel, validated only by learners themselves. If learners themselves are increasingly claiming the right to construct knowledge then the current gatekeepers will have to decide how to respond to that. This will be an interesting debate.

Conclusion: democratising the production of knowledge

In conclusion, NEC has an honourable record in the UK of assisting disadvantaged groups to access traditional education. Its use over the years of new technology and its refinement of learning design make it well placed to develop a new role, of assistant, guide and mentor to the growing band of learners who are already constructing their own definitions of knowledge and creating their own content. This new form of collective learning and validation poses many questions for the traditional education system, not least raising issues of plagiarism and copyright. We also have to reconcile the collective production of knowledge with a highly individualised examination system. Moving to learner-validated education could be seen as a subversive activity but in practice is more likely to settle into a form of para-education, a system that complements rather than substitutes for the traditional educational system in the UK.

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Author

Alison West
Chief Executive
National Extension College
Purbeck Road
Cambridge CB2 2HN
England
alison.west@nec.ac.uk

CATEGORIZATION OF VIRTUAL LEARNING ACTIVITIES

Peter Baumgartner, FernUniversität in Hagen & Ingrid Bergner, Innsbruck University

The need for an educational categorization scheme on e-learning

During the last few years we have evaluated several different types of tools for e-learning like Learning Management Systems (LMS) and Content Management Systems (CMS) [1]. They are based on a special evaluation methodology by Michael Scriven, [2] adapted and further elaborated for the purpose at hand. Based on an intensive market research, accompanied with qualitative description of the tools best ranked and updated on special websites [3] the results of our studies are well known in German speaking countries and serve as a kind of reference in the discussion of quality of e-learning.

But nonetheless: From the pedagogical point of view these evaluations show some limitations:

- The focus of attention is the tool and not the pedagogical situation: Our evaluation was a special type of evaluation – a product evaluation. Based on a market research they compare the different products in their functionality. So the unit of evaluation is the tool and not the pedagogical need and educational setting.
- They are based on the current market situation: As our starting point is the current market situation our results are time specific because of their market dependence. As new players (products) enter the market or a new improved version is launched, we have to update our evaluation.
- They do not necessarily support a pedagogical driven point of view: Many times we are confronted with the questions: What is the best tool for e-learning? There is no answer to this very general – and as we believe: wrong – question: It depends on your needs, your favorite teaching model, size, time and pre-requisite of the learning group, technical and organizational environments, skills, etc.

The last item – to ask for the best e-learning tool without qualifying to what respect it should be the best – demonstrates a wrong conceptual model of e-learning: Give me the right tool and I will be able to teach effectively and with high quality. This assumes the tools itself as the basis, the solid groundwork on which to design the learning situations.

But the tools themselves are implementation of pedagogical theories. This is even true whether the developers are conscious of this fact or not, as we already claimed long ago [4]. Software for design, implementations, use and evaluations of multiple-choice tests clearly has another pedagogical model in mind as software, which is designed to support knowledge acquisition in groups and collaborative work.

So it seems that we should reverse this kind of thinking process: Instead of asking for the appropriate tool we should force the questions: “What kind of educational strategy is necessary to convey my pedagogical objectives?” and then as the second derived question to ask: “Which tool fits best within this educational scenario?”

If this line of thinking is elaborated and generalized it results in different educational scenarios as a starting point and ends with a specific tool (or subset of tools) from a set of available database of tools derived from the current market situation. In this case the tools are evaluated with respects of the different educational scenarios resulting in different “best” tools for different scenarios. To support this line of reasoning one needs in addition to the evaluated e-learning tools a sound categorization scheme as the starting point.

There is another reason for the need of a categorization scheme for educational scenarios. This time it is not derived from methodological aspects but from practical and experiential motives. We know from our work with teachers and from e-learning projects [5] that there is severe knowledge barrier to overcome. The majority of teachers working in schools are educated with traditional pedagogical models. They do not know at first hand about differences and/or common features of face-to-face and e-learning scenarios.

What they need is a kind of anchor where they can start from their actual experiences and some help to elaborate and develop their knowledge under e-learning circumstances. In this respect the question which is to answer is: Given a well known educational scenario, for instance “brainstorming”: How can one use this technique in an online situation? What is the same? What is different? What kind of tool to use? etc.

So what we are looking for are kinds of well-known educational interaction patterns, that are described in terms of e-learning notions. These patterns are derived from general educational scenarios and should teach people the essence and skills how to use these pedagogical models under the new circumstances.

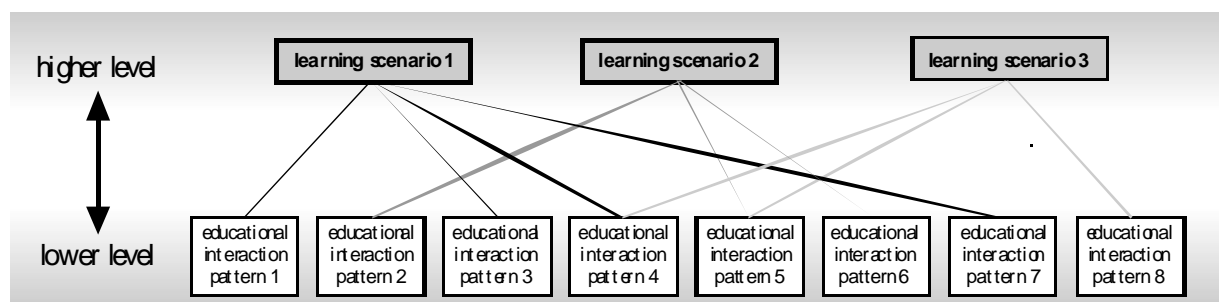


Fig.1: Higher and lower levels

Methodological considerations

Before we will go into substantial details it pays the effort to analyze and investigate the relationship between different levels of the categorization scheme.

Three levels of abstraction

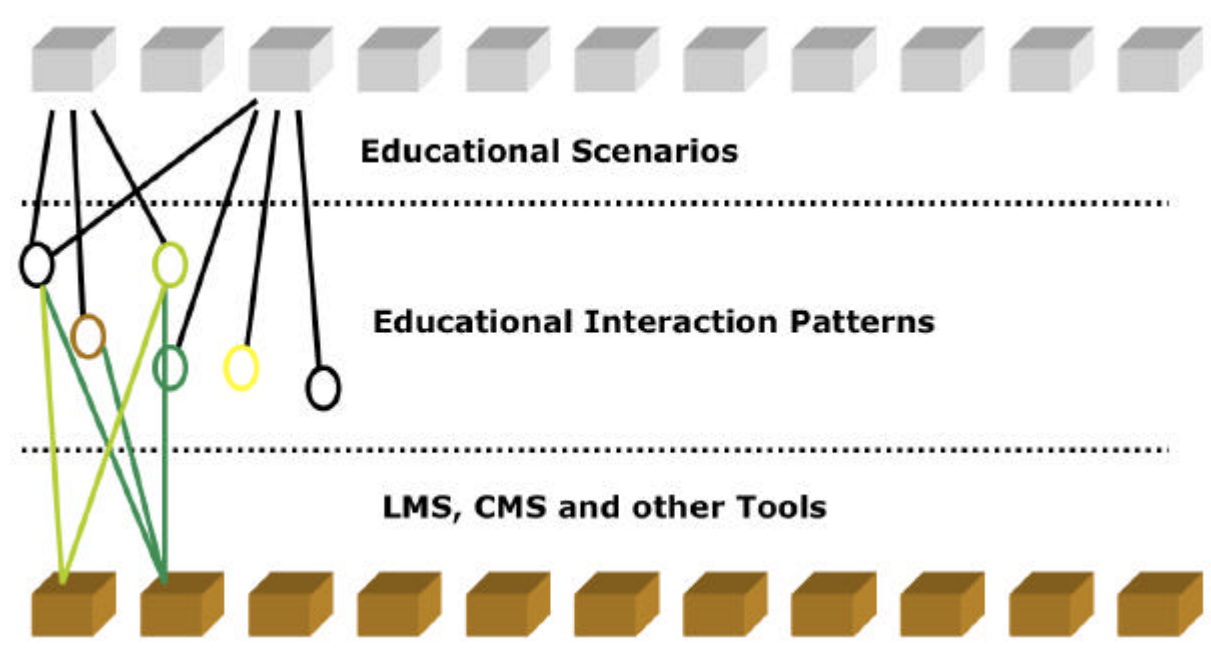


Fig.2: Three levels of abstraction

We will have three different levels: The first one (top level) is the most general one: It categorizes and describes educational scenarios, like guided discussion, brainstorming, disputation, open space and so on. The descriptions of these pedagogical learning models are completely independent of their actual implementation and this level will serve as the required anchor from where to start. Implementation details like differences between face-to-face or online learning or what kind of software to use are not relevant on this level.

The second level is in a certain sense the most interesting one: Here we need a detailed description of the different activities, which as a whole defines the scenario. Here you will find the differences between a traditional and an online learning situation. But still this description lacks technical details of the implementation. Questions like “What software product to use?” and “How to use a specific tool to implement a specific pattern?” are not answered yet. This level works with general types of tools (like Software for Chats, Fora, email etc.) and not with specific products, their interface and functions.

It is the third level where the detailed description of specific products will follow. But in contrast to a more general evaluation of the functionality of the product the different function will be mapped to and evaluated in accordance to the educational interaction patterns. It describes the products in terms of the adequacy to a certain educational interaction pattern, which itself is derived from a pedagogic learning model. This has intriguing consequences: Some products are good for some educational patterns but not for others. In order to implement a certain educational scenario it could be that one needs not only different kinds of tools, but also from these just one or two functions.

Practical consequences of this categorization scheme

One of the apparent consequences of this proposed line of reasoning is that there is evidently no unique power tool suitable for all purposes. We know that this outcome may result in insecurities and even fear in the part of teachers as it means to get involved in the learning process of several different tools. There is also the additional costs and organizational overhead of different tools to consider.

But nonetheless we think that our approach is not only adequate for theoretical reasons but also for practical purposes:

- There is always to find a compromise between different tools and their functionalities, their product, implementation and support costs. It isn't feasible to buy and learn for every instance of different use the most adequate tool on the market.
- But it is important to know which tools support a specific pedagogical objective in a better way. And it is also important to know of the weaknesses of a tool. It is far better to know about the limitation of a product rather than using it in an inadequate way.
- This is the only way to learn to think of technological resources in educational terms. This is the only guarantee that educationally motivated users form a pressure group to force companies to improve their products in pedagogical aspects.

Substantial Examples

Top Level (educational scenarios):

The description of historically relevant pedagogical learning models (with a special focus on dynamic approaches like problem-based learning, explorative learning, reflective learning) has to be based on literature and analytical study. Throughout the last 100 years instructional theory has developed many different educational models and learning scenarios. What we are still missing is not only an educationally sound and complete categorization scheme, but also the application of these models to the new forms and types of virtual learning environments.

This sound categorization scheme is not easy to elaborate and needs a revisited description and detailed survey of the historically relevant educational models. As a first starting point we can build on the previous work done by Norbert Meder in his scheme of “cooperative objects”[6].

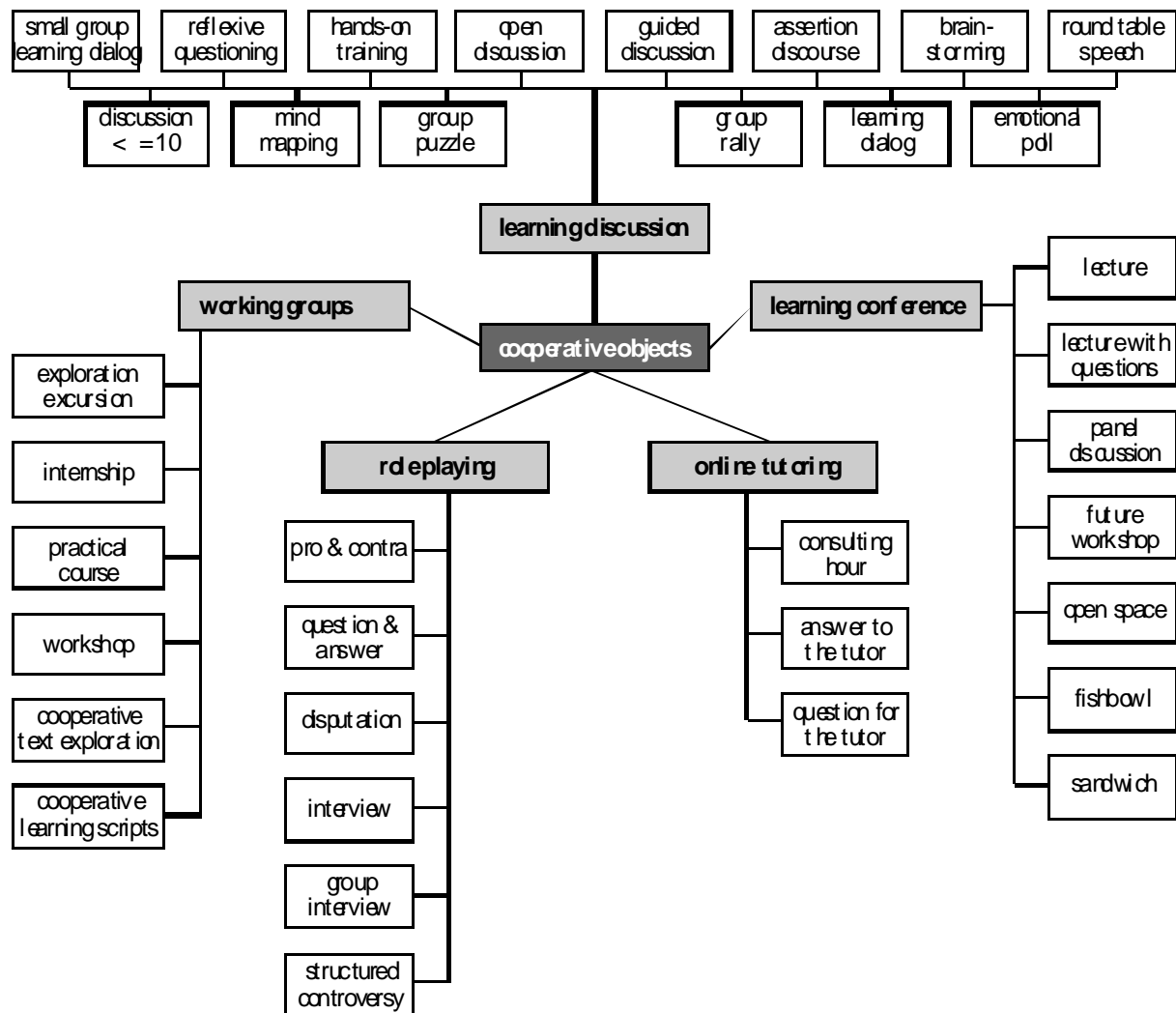


Fig.3: Didactical Ontology by Norbert Meder

Intermediate level (educational interaction patterns):

This level is perhaps the most interesting and relevant one, but it also still lacks the greatest amount of analytical description: As a first starting point we have identified over 62 educational interaction patterns [7]. We have published them for this conference on a special (multilingual) website [8]. (See also the accompanying article by Ingrid Bergner and Peter Baumgartner for this conference [9].)

At the time these patterns were elaborated the analysis was not influenced by the stratification theory explained before. Therefore the terminology in these descriptions is not theoretically sound. Sometimes the educational interaction patterns are called methods – a very general notion – which of course does not present us the picture and relationships we tried to provide with this article.

We think that there are still many more educational interaction patterns, maybe 200-300. In order to add these missing patterns we also need to explore those of which we already have a description. How do they fit into the educational scenarios and how many scenarios can we distinguish on the basis of these many different interaction patterns. In contrast to the traditional literature, which is mostly lacking in granularity, we think there are not only about 10 but maybe 30-60 types of scenarios, that need a more detailed description in the light of their underlying educational interaction patterns. Traditionally these educational scenarios lack detailed and finely granulated descriptions because there was (and still is) a huge divide between theoretical consideration and practical usage in the

pedagogical models. Our chosen qualification to describe these scenarios under the terms of the underlying educational interactive patterns guarantees a much more detailed description.

For example the specific educational scenario “guided discussion” – as mentioned in the above diagram. We could define several interaction patterns for this scenario such as: to initiate a topic, to respond, to filter, to revise, to reorganize etc. One needs all these patterns in order to get a sound “guided discussion” scenario, which works in practical educational situations.

Some of these interaction patterns mentioned before form parts of other scenarios, but others do not. Take for instance brainstorming: In brainstorming you need the interaction pattern “to initiate a topic” like in the guided discussion, but “filtering” clearly is not part of the brainstorming scenario.

We can now reformulate our previous philosophical considerations:

- Not all combinations of patterns create meaningful scenarios. The relationship between patterns is a factor in a scenario too. The knowledge of the rules of every chessman does not make a good chess player.
- The educational interaction patterns make certain learning scenarios possible, but you cannot simply reduce the scenarios to the patterns, the scenarios “organize” the patterns into meaningful units.

Bottom level (tools):

The detailed evaluation of the tools we have already done can serve as a first starting point. But we have to reformulate the criteria and functionalities of the tools in order to comply with the new requirements. Independent of the positioning of the tool done by its producer or reseller is mainly market driven and many times does not fit an educational sound learning or teaching model. We have to find all those functionalities that form part of a specific educational interaction pattern. Even if those functions are hidden, spread out over different parts of the software or just missing.

And with these constraints in mind (what and how does a specific functionality contribute that an educational interaction pattern can be executed) we will overcome the traditional and therefore predominant reference to the common sense knowledge in education. As Michael Polanyi pointed out several times in “Tacit Knowledge”: There is a contradiction in most of our learning processes: We learn many times through demonstrations by example, philosophically called deictical definitions. Whenever we point to something new (or to a new aspect of something) how can we be sure that our intention is understood and the right thing learned?

Take for instance the example to teach a child what a car is. In pointing to a car and muttering the word “car”: How do we know that the child does not believe that we mean the color of the car or its motion? This is a trivial example but the essence is that all learning by example is characterized by an under specification of the learning content. All learning by examples needs the assumption of an active intelligent conclusion by the learner itself. We cannot transmit knowledge one by one without the active participation of the learner who constructs his/her mental model.

In developing software tools we have now a unique possibility, which is also a new chance for the learning process: In order to work properly the developer has to specify very much in detail the required functions. Using this software is not only using a tool to manage a certain process, but also a learning tool to understand the world. It functions like the stick for the blind: A tool for exploring, understanding and managing the external world. Taking this parallel we can still go further: In order to understand and manage all different aspects of the reality one has to have the proper and adequate tool. For someone which only has a hammer the whole world looks like a nail.

The practical conclusion of this consideration is: There is no way around the fact that we will need different kinds of software tools for different learning objectives. These different tools are not the starting point for our learning processes and they are not to be confused with reality itself. They are just means to construct our reality, to shed light to certain aspects of the external world. Form their usage the reality we perceive emerges and we learn how to cope with the external world.

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Authors:

Prof. Dr. habil. Peter Baumgartner,
FernUniversität in Hagen, Media Science and Media Education
Fleyer Straße 204, D-58097 Hagen
Peter.Baumgartner@fernuni-hagen.de <http://www.peter.baumgartner.name/>

Mag. phil. Ingrid Bergner
Abendgymnasium für Berufstätige/Innsbruck University
Adolf-Pichlerplatz 1, A-6020 Innsbruck
Ingrid.Bergner@uibk.ac.at, <http://www.ingrid.bergner.name/>

QUALITY IN E-LEARNING FROM A LEARNER'S PERSPECTIVE

Ulf-Daniel Ehlers, University of Duisburg-Essen

1. Introduction

What makes e-learning successful? This question arises at the beginning of a large number of debates on the subject of quality in e-learning. On the one hand, the increasing importance attached to the topic of quality in general is evident in many publications, discussions and lectures. On the other hand, however, there is also great uncertainty among decision-makers and managers as well as among developers, trainers and learners: instructors find themselves confronted with a new role in which they are tutors and facilitators for learning processes. Software developers more and more have to go beyond the limits of their own discipline when designing and implementing learning software; they are forced to seek interdisciplinary exchange with teachers, authors and learners. Authors are required to think in a new way: no longer the instructional material is built in a series of straight consecutive units where each presentation is based on the preceding one, but learning modules that are decontextualized and therefore easier to reuse are to be created. On the learner's side, the question arises which characteristics are most important for good e-learning-environments and which providers offer the best performance at a reasonable price in a market that is continuously differentiating further. Providers, for their part, find themselves confronted with the continually progressing didactization of a development that was originally technological and are thus faced with an increasing learner orientation (cf. Ehlers et al. 2003b).

2. The Learners Perspective in the Quality Debate

Finding answers to questions regarding quality in e-learning is one of the central challenges for theory and practice if e-learning is to become as important as traditional qualification measures in the future. The question arises how such a complex concept, as quality can be comprehended systematically. Three different dimensions can be distinguished here (cf. Ehlers 2002a, 2002b, 2003a): different quality understandings, different quality perspectives and different levels of the educational process to which quality can apply (fig. 1).

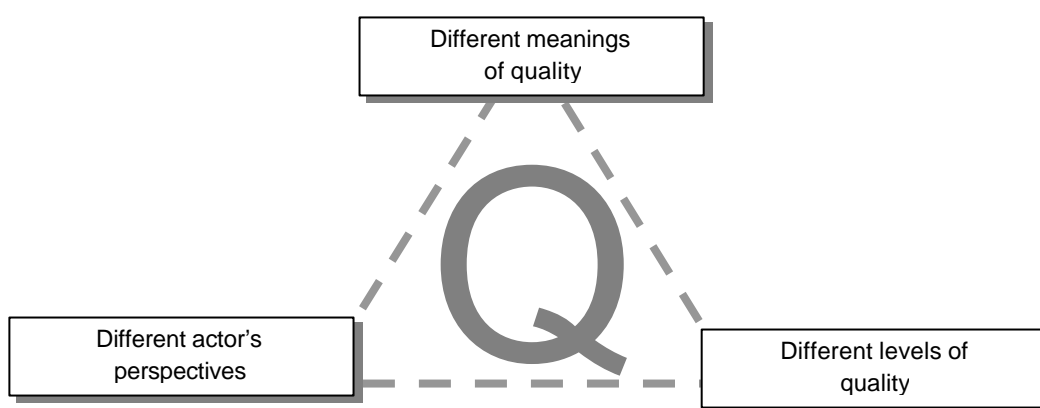


Figure 1: Multiple perspectives of quality in e-learning (cf. Ehlers 2003b)

First of all quality can be distinguished into several different levels. According to quality and evaluation research an educational process can be subdivided into five subsections or sub-processes [1]. Quality applies to each of those sub sections and can thus refer to context-quality, structure-quality, process-quality, output-quality or impact-quality. All the same we have to take the different perspectives on quality into account that were already described above (see chapter 1). And last but

not least it is important to clarify different semantic understandings of what quality actually means: If quality is understood in the way of excellence we can distinguish it from quality in the sense of usability or value for money [2]. Defining quality thus means positioning oneself in this multi-dimensional space (fig. 1). There is no patent remedy and no universally applicable, standard perspective for developing or assuring quality. Quality development always has to take different perspectives and different meanings into account.

In the presented work the perspective of the learner is focussed on. This goes along with a new awareness in the field of quality research in education that emphasizes the importance of a subjective research perspective. In research as well as on the level of policy makers, in industry and private educational contexts we can observe an uprising orientation at the needs of individual competence development and learning processes. Life-long learning processes can no longer be standardized but have to be constructed along individual training biographies (Robinson/ Arthy 1998). The situation today is not only characterized by the importance of knowledge and information, but the acquisition and application of it and the ability to generate, process and communicate knowledge and information using technological tools (Castells 1996) – skills that have to be developed according to personal preferences and usage contexts.

Apart from empirical evidence there are also more general/ structural reasons to focus on quality from a learner's perspective: As well as in the area of services in general quality in learning has to be considered as a co-production process between the learning-environment and the learner – and is thus part of his/her own responsibility. A learning process is not something that is delivered to a learner by an e-learning-provider but rather constitutes a process of co-production between the learner and the learning-environment. That means that the product/ outcome of an educational process can not exclusively be influenced by the 'production processes' of an educational institution. This differentiates the field of education and services in general from the trading mechanisms between consumer and producer according to the conventional market paradigm: Education can not be traded or bought by the clients/ learners, learning rather constitutes a process that they have to carry out by themselves.

The definition of quality therefore has to be oriented at the final position of the learning-services, as there is the learner. Of course this does not mean that the learner's perspective and preferences alone has to be taken into account: economical, organisational or even regulations by law have also are to be considered. Figure 2 shows that a learning environment consists of four different components that each have their different quality concepts. Quality development from a learner's perspective therefore means to take the learners preferences as the starting point of quality development in all other areas.



Figure 2: The Learners position in a learning environment (Paradigm of constructing and evaluation learning environments according to Fricke 1995)

Therefore the orientation on the learners needs on a realistic economical basis more and more becomes a leading concept in on quality research. The presented survey 'Quality from a learners perspective'

analyses quality from exactly this point of view. Two goals are being aimed at: First, the research is concerned with the question which dimensions are constituting quality in e-learning from a learner's perspective; that is: which quality aspects, dimensions or criteria are important for learners? Secondly, quality is no longer viewed as a concept in which the same quality approaches or quality criteria apply to all learners, but rather where different learners have different preferences regarding quality in e-learning. The results clearly confirm this hypothesis. For the first time at all the research project makes available an empirical based classification of subjective quality concepts in e-learning. Thus now there is a basis for learner focussed quality development in E-Learning.

The survey used qualitative data as well as quantitative data. The connection between these different approaches – also known as the methodological concept of triangulation (cf. Treumann 1998) – enables researchers to gain a more in-depth insight into the field of subjective quality preferences. The survey was conducted in two phases: First a qualitative inventory was gathered from interview data of 56 interviews with learners who had considerable experience in the field of e-learning. This inventory formed the bases for a quantitative research phase in which 2000 learners answered a questionnaire on their quality preferences for e-learning (n=1994). The data were then analysed using multivariate statistics – principal component analytical and cluster analytical methodology.

3. Comprehensive E-Learning Services for Learners

A learner focussed quality concept has to be more comprehensive than just focussing on aspects of instructional or technological interface design. This is clearly shown in the results of the survey. Accordingly subjective quality requirements can be structured in 7 fields of quality:

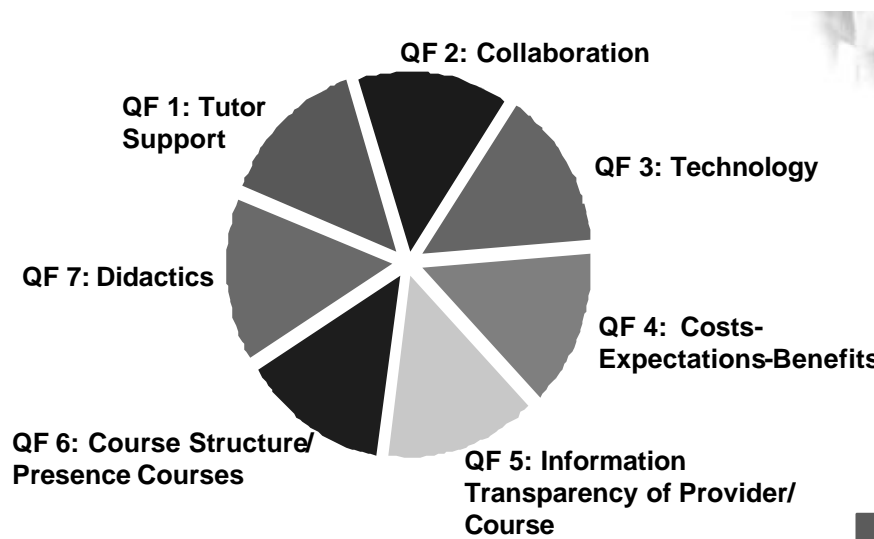


Figure 3: Model of subjective quality requirements (cf. Ehlers 2003)

The so-called subjective model of quality is organized in a three level structure. 153 factors of subjective quality form the basis of the empirical model. They are the result of an in-depth oral interview inquiry with learners. This inventory then was - on the basis of the data of a standardized online survey - structured into 30 dimensions of quality in E-learning (Principal Component Analysis). The dimensions represent bundles of factors that – empirically – belong together (correlate). On the top level the resulting 30 dimensions are then structured into seven fields of subjective quality according to thematic resemblance.

The dimensions are the result of a principal component analysis (PCA). This method allows reducing the variety of many factors (153) to few powerful bundles of factors – or: dimensions – that can explain the differences in the quality preferences of the learners. It is important to notice that the 30 preference dimensions are not all equally important to learners. They rather form a grid of dimensions that **can** be of relevance to a specific user. For each user the described dimensions therefore are likely to be of different importance for quality in E-Learning. In a way those dimensions are the line along which users can be different in their quality preferences.

Each of the 30 dimensions represents a set of criteria of learners preferences that are clustered to a dimension on basis of empirical evidence. In the following section a more detailed overview on the 30 dimensions of subjective quality will be given. They are presented according to the 7 fields of quality they each belong to.

3.1 Quality Field 1: Tutor Support

In this field quality preferences are represented that learners have towards the communication and cooperation with the tutor of an online course. The survey shows that tutor support for learners is very important in general – regardless their other preferences: Between 74,4% and 97,7% of learners in the different preference groups value tutor support in general as important or very important. However – there are great differences between the learners as to how the tutor support should be performed. Their preferences differ along the following dimensions:

Dimension 1: Interaction Centeredness		This dimension relates to communication and interaction between the tutor and the learner. Especially important in this interaction is the aspect of a bi-directional interaction: The learner does not only want to have a tutorial feedback but wants to give feedback to the tutor as well.
Dimension 2: Moderation of Learning Processes		The dimension expresses the preference for an active moderation of learning processes by the tutor in a communicative manner.
Dimension Learner vs. Content Centeredness	3:	Learners vary in their preferences of tutorial behaviour along the lines of a rather learner oriented interaction style, referring to their personal learning process on the one hand and a more content oriented interaction and communication processes between tutors and themselves on the other hand.
Dimension Individualized Learner Support	4:	This dimension relates to a form of tutor support that focuses especially on the learner's situation and supports – apart from the course topic – the learner with additional information according to his/ her interests.
Dimension 5: Goal- vs. Development Centeredness		This differentiation expresses a tutorial behaviour that focuses primarily on the course goals on the one hand and a more learner oriented tutoring style that supports the personal development of learners learning- and social skills.

Learners do not only vary according to their preference sets in regard to tutorial communication and cooperation performance but also in the kind of media they wish to use for getting in contact with tutors.

Dimension Traditional Communication Media	6:	Telephone, Fax, Letter (mail)
Dimension 7: Synchronous Communication Media		Video conferencing, Chat
Dimension 8 Asynchronous Communication Media		E-Mail, Discussion Forums

3.3 Quality Field 2: Cooperation and Communication in the Course

This field contains quality requirements that learners express towards the course concerning the communication and cooperation environment with other learners in learning groups, with experts or the tutor.

Dimension 9: Social Cooperation		The cooperation sequences in the online course should especially focus on the aspect of social interactions, i.e. online discussions, group activities, face-to-face communication in presence phases.
Dimension 10: Discursive Cooperation		The cooperation sequences in the online course should especially focus on the integration of discursive course settings and controversial topics. Not the social aspect is emphasized here but the active knowledge creation in argumentative settings.

3.4 Quality Field 3: Technology

The field of technical requirements can also be important to learners in regard to the following three dimensions. Technical requirements however seem to have the status of hygienic factors. That means that if technical requirements are fulfilled they do not raise the perceived quality very much – as they are taken for granted. Yet if the expected technical standards are not met the learners quality assessment decreases.

Dimension 11: Adaptivity and personalisation	It is important that the learning platform has the capability adapting to the users settings and provides the possibility “starting where the user logged off last time”.
Dimension 12: Synchronous Communication possibilities	The Platform should provide the possibility of synchronous communication (Chat, Video Conferencing).
Dimension 13: Availability of contents (technical)	The content should be available in different formats. It should be possible for the user to save course material on his/her home computer.

3.5 Quality Field 4: Costs - Expectations - Value

The cost-value assessment of learners is one factor that determines their quality judgment of an E-Learning-Course. It can be seen in close relation to the expectation learners have when entering a course setting, which determine their outcome assessment. The cost and effort that learners have to assign to the learning experience has to be in a subjective adequate relation to the benefits and the outcome.

Dimension 14: Expectation of Individualisation and Need Orientation	This factor expresses the expectation towards online learning that it is flexible (time wise) and individualized in the course structure regarding to content and support.
Dimension 15: Individual Non-Economic Costs	The most important cost category is the effort it takes to learn motivated and concentrate on the course although it is an individualized learning scenario.
Dimension 16: Economic Costs	The most important costs are the financial costs.
Dimension 17: Practical Benefits	Learners expects a practical benefit for their every day working life.
Dimension 18: Interest in Course and Media Usage	The user is interested in the course not only because of the course topic but also because of interest in online learning and the usage of the internet.

3.6 Quality Field 5: Information transparency

Another field of quality preferences refers to the information possibilities learners have about a course or an institution/ organization which is offering the course. It contains the provision of formal and standard information as well as individualized counselling on course contents, learning methodology or technical advise.

Dimension 19: Counselling, Advise	Counselling and advise before learners enter an online course can be an important dimension of quality.
Dimension 20: Organisational Information	It can be of importance to learners that they can not only access information about the course they want to take but also about issues concerning the course certificate, the tutors qualification and the organisation that offers the course.
Dimension 21: Information About Course Goals and Contents	This dimension expresses the importance for learners to access detailed information about the course they are going to take (e.g. an prototype schedule).

3.7 Quality Field 6: Course structure

This field contains learner's requirements concerning the structure of an e-learning course. Learner's quality preferences clearly show that presence lessons as part of an e-learning-course (blended learning) are of high importance to certain groups of learners whereas others do not value them as important. The dimensions of this quality field summarizes, which functions these presence courses have from a learners perspective.

Dimension 22: Personal Support of Learning Processes	This dimension specifies the importance of a personal and individualised course support structure in form of presence courses.
Dimension 23: Introduction to Technical Aspects and to the Content	It can be of importance to learners to have an introduction in form of a presence workshop to important technical and content aspects of the course.
Dimension 24: Tests and Exams	An important function in presence phases can be the possibility to take exams and tests.

3.8 Quality Field 7: Didactics

The research shows that a lot of quality preferences that were analysed fall into this category. It covers aspects of content, learning goals, methods and materials. Experienced e-learners are often very precise in their requirements concerning the didactical setting of an e-learning course.

Dimension 25: Background Material	This dimension expresses the importance of having access to background materials on the course topics.
Dimension 26: Multimedia Enriched Presentation Material	For certain groups of learners it is important to use materials that are enriched by multimedia and use not only one but several media resources (audio, visual, movies, texts, etc.).
Dimension 27: Structured and Goal Oriented Course Material	An important quality dimension can be to structure the course material in a goal oriented way.
Dimension 28: Support of Learning	This dimension contains criteria that express that the course should enable users to gain learning literacy and become more skilled in their life long learning competencies.
Dimension 29: Feedback on Learning Progress	Tests and exams should be integrated into the course material to get feedback on the learning progress.
Dimension 30: Individualized Tasks	The tasks should be especially designed to fit the learner's needs and goals.

4. Learners Quality Preferences: Individual – but Still Manageable

It is now obvious that learners quality needs can be described in terms of their preferences towards each of the 30 specified dimensions. On basis of the empirical data it is thus possible to construct an individual preference profile for each learner. Every learner has a specific value on each of the previously described dimensions. In a next research step the data was analysed to understand if it was possible to find similarities in users quality preferences. Therefore an additional analysis of the gathered data was performed with a subset of cases (n=1321) using cluster algorithms (ward & k-means).

Each users individual preference profile was analysed and compared to those of other learners in order to find resembling profiles that could be combined to groups that are alike concerning their quality needs – but which on the other hand are different to other groups (cluster analysis). The result shows

that four target groups can be identified. Figure 4 shows the four target groups and gives their main characteristics. The four target groups differ very much in their demands for communication and tutor support as well as group activities and social contacts in an online course.

Target Groups: Quality Preferences

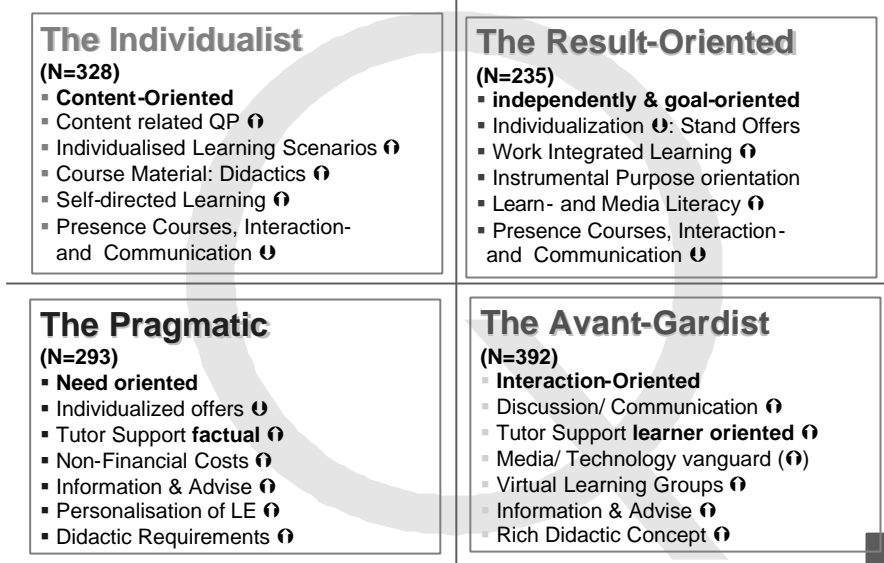


Figure 4: Four quality specific target groups

5. Conclusion

Two results have been contributed to the debate of quality in e-learning: An empirical model representing learners preferences in 30 dimensions and an analysis and description of four preference profiles. The research clearly shows that learners distinguish their quality preferences in e-learning. All learners had considerable experiences in e-learning and can be grouped into profiles according their quality preferences. This leads to the conclusion that future quality development in e-learning has to be oriented at the learners needs and situation. No longer general criteria or the same guidelines for all learners can be applied but individual learning services are needed that support learners according to their subjective preference profile.

Annotations

[1] A in depth analysis of concepts from evaluation and quality research referring to Stufflebeam 1972, 2000, Auer/ Carstensen 1995, Clayton/ Cattarello 1991 and Donabedian 1980 by Ehlers 2003a shows that currently five levels of quality in education can be distinguished.

[2] For different semantic quality understandings see Ehlers 2003a.

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Author:

Ulf-Daniel Ehlers
Information Systems for Production and Operations Management
University of Duisburg-Essen
uehlers@wi-inf.uni-essen.de

THE EUROPEAN QUALITY OBSERVATORY ENHANCING QUALITY FOR TOMORROW'S LEARNERS

*Ulf-Daniel Ehlers, Barbara U. Hildebrandt, Jan M. Pawlowski & Sinje J. Teschler
University of Duisburg-Essen*

1. Quality in Europe: A Field of Great Diversity

Quality in E-Learning in Europe is a field of large variety (cf. Ehlers, et al. 2003). Many different approaches on different levels, for different educational sectors, contexts and target groups compete with each other in the area of quality management, -assurance and -development. Not only different techniques and methods to enhance quality in E-Learning are used here but also different levels of educational quality are addressed in the various approaches and different concepts of quality itself can be recognised (e. g. pedagogical quality, technological quality, economical quality, etc.). Approaching this field on a European scale it becomes an even more complex matter.

The problem with finding a suitable approach for a specific educational purpose – e. g. for improving the learner support in an E-Learning-Environment – is no longer that there are too few approaches to choose from, but rather that it is difficult to structure the field of approaches properly in a way to map the needs of users to the quality approaches that are available. What is needed in this situation is a quality concept for quality approaches,

- to analyse and compare different quality approaches,
- to access information on the usage of quality approaches,
- to evaluate different implementation/ usage strategies, and
- to have information on key factors for failure or success.

Such a concept then would enable users of quality approaches to efficiently compare quality approaches to find the right one for their specific needs. In addition to that such an approach would structure and classify the field of quality approaches and thus would enable to go first steps into the direction of researching the impact of (management-)approaches, strategies, criteria and evaluation concepts on the educational process (cf. Pawlowski 2003).

2. The European Quality Observatory

The European Quality Observatory (EQO), a European consortium of expert organisations in the field of quality in E-Learning, led by the University of Duisburg-Essen, has taken these aspects as a starting point for a research project which started in March 2003 to develop and implement a framework to collect, analyse and compare quality approaches in European E-Learning. The core objectives of the European project consortium can be summarised in four areas (cf. Pawlowski 2003):

- to provide a conceptual framework for analysis, description and comparison of quality approaches in education (spec. E-Learning) on a European level: the EQO Metadata Model (see below);
- to establish an internet-based repository for quality approaches (quality development, quality management, quality assessment) in the field of E-Learning for users of these approaches (e. g. teachers, tutors, developers, CEOs, etc.) (see chapter 3);
- to provide recommendations for the use and experiences of other users of quality approaches on a European level;
- to provide services to support the implementation of quality approaches & support the community of users.

The project is creating a European quality community by collecting, analysing and synthesising the different approaches currently in use, as there are quality management, quality assurance and quality assessment approaches and is by that facilitating cross-country understanding of quality systems. While the former terms are in common use, they are often not fully understood. EQO will demystify them through presenting them in a new, easier to understand format. The network consists of users of quality approaches, organisations and other networks, and is designed to bring these together into a community of expertise to exchange experiences, evaluation and know-how.

The basis for the research and tools that will support users of quality approaches to find and implement suitable approaches is a metadata model for the analysis, description and thus comparison of quality approaches – the EQO Metadata Model. The model is the result of an extensive research and intensive consensus building phase between the European partners of the EQO project and discussions in various standardisation bodies on the European (CEN/ISSS¹) and international (ISO²) level. It follows a situated approach with the aim to model requirements for certain specific situations in a given context (Allert et al. 2003).

As the field of quality in education is a very complex one the EQO model covers a theoretical and a practical analysis of quality approaches and is therefore divided into two main parts. In the first part the quality approaches are analysed on a theoretical basis using the official documentation and publications about the different approaches. In a second step the experiences users made in practically implementing quality approaches in concrete scenarios are categorised and analysed. Based on the conceptual design of the results of the CEN/ISSS Workshop Learning Technologies (CEN Workshop Agreement 14644) and common metadata schemes as e. g. LOM (Learning Object Metadata) the EQO Model for the first time provides a framework to handle the great variety of approaches in the field of European E-Learning-Quality (for more details see <http://www.eqo.info>). Within the EQO Model quality approaches are described using a hierarchy of data elements grouped in categories and subcategories. For a better comparison the value spaces for the data elements are defined by involving predetermined vocabularies and classification schemes wherever possible. The theoretical analysis of approaches covers the following three main categories:

1. **General Description:** In this category general information on the quality approach are analysed.
2. **Context:** This category analyses the intended area of usage and the educational context the quality approach is applied to.
3. **Method:** This category summarises information about the scope of the quality approach.

The **general description** about quality approaches deals with information such as title (name of the approach), textual description of the actual version of this approach, the language in which this approach is expressed, the location where it can be accessed as well as copyright and other restrictions for using this approach (such as costs and charging schemes). The **context category** summarises information about the educational context, such as the educational level (e. g. “university”) and the industry sector or educational institution the approach is related to (e. g. “manufacturing industry”). Also the target group this quality approach aims to is retrieved (e. g. “author” of learning materials) as well as the cultural or regional coverage of the approach (e. g. “not restricted to a country”). Furthermore the EQO model expresses if the quality approach was developed for a specific topic within a classification scheme and for which educational processes it can be applied. In a last subcategory the quality goals that the approach addresses respectively the sense in which quality is defined in that approach are expressed. The user is given the possibility to rate the importance of certain criterions here. The **method category** defines if the quality approach focuses on the results of a process or the process itself (e. g. “product-oriented”) and the methods the quality approach uses (like “benchmarking”, “evaluation”, “standards”, etc.).

¹ CEN: European Committee for Standardisation (Comité Européen de Normalisation); ISSS: Information Society Standardisation System

² ISO: International Standardization Organization

The analysis of practical experiences with using quality approaches is covered through the **category experiences**. This category is used for collecting and analysing experiences users made by applying a specific quality approach. While the first three main categories of the EQO Model describe the generic quality approach, the experience category describes the instantiation of the approach for a specific implementation. Although model and instantiation might be quite different and therefore a mapping of experiences to a certain model could be difficult in some cases, the EQO project expects the experiences part to provide valuable information to quality practitioners. The experiences section is a fairly innovative analysis category, which will become more important in the future because it aims at analysing the impact of quality concepts. The idea is to gather data on how educational processes are affected by quality instruments.

Using the EQO Model as a basic analysis framework the project EQO will establish a network that takes countries' different approaches into account and is therefore able to encourage a fruitful transnational exchange of experience. At the same time the framework promotes much needed quality standardisation. Standardisation in this case means to promote the diversity in the field of European quality approaches by using the metadata model as a common reference framework for description. The project facilitates the process of harmonisation in European E-Learning-Quality in two ways:

1. An **analytical harmonisation approach** by contributing a well worked out metadata model for analysis of quality approaches. The model is generic enough to cover all quality approaches existing in the field of European E-Learning-Quality and specific in the sense that it contains all those categories for analysis that enable a clear differentiation between the various approaches.
2. A **community based consolidation approach** by introducing and discussing the model in all relevant communities of science and addressing groups of relevant actors in the field of European quality in E-Learning.

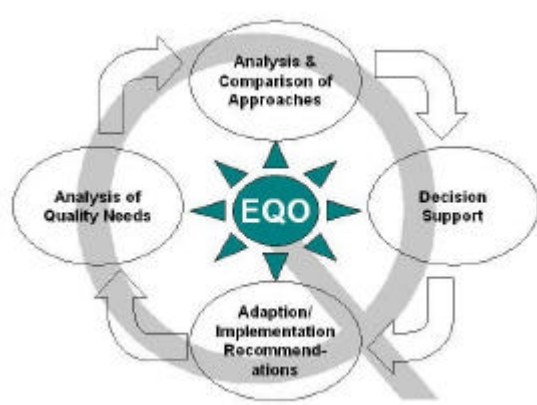


Figure 1: Decision support for quality approaches

One key result of EQO will be the development and implementation of a “quality” internet repository where quality approaches are collected, analysed and presented to users as well as experiences in usage of quality systems are collected. This information will then be stored using the previously described metadata model, to ensure that it is kept in a standardised form. Those using the repository will be able to submit their demands through a search tool designed to help them retrieve the relevant quality approach. The software has been designed to be flexible enough to enable users to access process models and product criteria specific to their situation. In turn, this will help to improve the quality of their E-Learning processes and products. The EQO Repository works according to a four-step analysis (fig. 1):

1. **Analysis of Quality Needs:** The quality needs of the users applying to their specific situation are analysed. This analysis is done on the basis of the EQO Metadata model which categories function here as an assessment framework. An example for this could be a manager of an organisation in communications industry who is searching for a quality approach especially dealing with improving the motivation of learners in non school vocational education.

2. **Analysis and comparison of Approaches:** On the basis of the needs analysis, existing quality approaches are analysed and then linked to the users' needs. As a result the users are presented with individually fitting quality approaches for their specific situation. The manager mentioned above will receive a list of quality approaches dealing with his problem e. g. especially designed for appliance in his country, using different methods like certification and policies, and dealing with the improvement of technical or pedagogical quality goals, etc.
3. **Decision support:** Users are supported in their decision for a quality approach by information of a database of other users' experiences and assessments. The pool of experiences on the use of quality approaches is a core function of the EQO Repository. This enables to gather and aggregate data on the impact and success of implementing quality approaches for educational scenarios. The decision is supported by mapping experiences to the previously analysed requirements.
4. **Adaptation and Implementation & Recommendation:** In this step the chosen approach has to be adapted to the organisations' specific needs. Individual quality profiles can be created as a result, that help to implement the approach. The analysis categories of the EQO Repository are designed to facilitate the individual adaptation process.

User demands will also have the effect of enriching the observatory's understanding of search techniques and of the kinds of information demanded. As the observatory is linked to the CEN Learning Technologies Workshop, any new knowledge gained will be forwarded to the workshop. It can then be automatically transferred to the relevant research and standardisation communities.

The European Quality Observatory supports the decision-making process by providing a structured method as it is described above. Quality approaches are compared using metadata and are analysed in order to support decisions. Decision-makers and users can now study quality management and quality assurance approaches and compare them using the above-mentioned metadata. In this way, decisions for quality approaches can be considerably accelerated and simplified. For the first time, a systematic method is available for selecting suitable quality approaches in the educational field. As a result, crucial decision questions for selecting a quality approach can be derived from the model.

3. Implementation of the EQO Model: A Tool for Quality in Tomorrow's Education

The EQO Model is implemented as an internet-based repository which can be used for description and analysis of quality approaches according to the fields and areas of analysis. It is embedded into a portal for quality in E-Learning that serves as an exchange platform for a growing number of users and experts in the field of European quality in E-Learning. The repository includes a continuously increasing number of quality approaches which are analysed in detail and are stored in the database. Additionally a community of practice provides their experiences with the implementation of the different quality approaches and allows users of the repository to benefit from this information and expertise. Every user who is engaged with the issue of quality in European education is invited to get a member of the community. To ensure a high quality of the information stored in the repository there also exists an elaborated partnership and cooperation program.

The repository is designed to easily analyse quality approaches for E-Learning according to a common scheme (the EQO Model) which is described above. Registered users of the portal are encouraged to add quality approaches to the internet-based repository. All they have to do is to fill in several form fields to describe and categorise each quality approach they want to add. Figure 2 shows that it is quite convenient to contribute new quality approaches: The user is guided through the contribution process with the help of a questionnaire, divided into sections according to the EQO Model: general information, context of usage, methodology of the quality approach. Additionally the repository provides a special section for contributing experiences with using a particular quality approach. Because of the European character of the portal the analysis form will be provided in several languages. The user then selects a suitable language first and then fills in the fields for all analysis sections of the EQO Model. Thereby the sections are given in itemised pages and thus allow a step by step analysis.

In order to allow the user to easily find a suitable approach for a specific educational purpose four different options to search the database are provided in the repository: a quick search, a browse function, an advanced search and a recommendation mechanism, which recommends quality approaches for specified quality needs. The **quick search**, which is the only function for unregistered users, allows an easy full-text search in the database. After entering a keyword the user is provided with matching search results. The **browse** option allows the user to scan for quality approaches fitting a specific category and criterion to choose from. For this purpose a set of default categories (language, educational level, target group, country, process, goal, focus and method) is presented which can be further specified by choosing from given pull-down menus. For example, figure 3 shows a browse inquiry for the “country” “Norway“. For this chosen browse option the search results will give an overview of all approaches in the database that are (intended to be) applied in Norway.

The **advanced search** will form a combination of the other functions described above. It allows to search for different categories and criteria at the same time. Thus the user of the repository is able to search more specific and gets modified results in the search list differentiated according to the previously specified quality needs. Additionally a **recommendation** mechanism will be provided. A user can specify a profile of specific quality needs, can apply different weights to the used factors and variables and will then be provided with a list of fitting quality approaches for his/her situation on basis of other users’ and experts’ estimations.

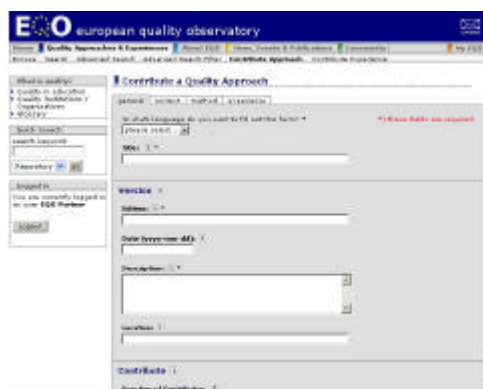


Figure 2: Contribute a quality approach



Figure 3: Browse through quality approaches

Apart from the repository the portal provides a variety of other functions to the user. Apart from highly useful and well structured information on developments and discussions in the area of quality in E-Learning, research results and downloadable publications, the user will get the opportunity to get into contact with other users and experts in the field of quality of all over Europe.

4. Conclusion

In this contribution, the diversity of quality management and quality assurance concepts has been described. Due to the multitude of existing approaches, a classification scheme for quality approaches has been put forward that serves as the basis for the decision-making processes.

Decisions on an appropriate quality system for an organisation can be considerably accelerated and simplified by using central questions and the support provided by the European Quality Observatory (in particular with the EQO model).

Such a procedure creates a sound basis for a quality harmonisation process in the educational field, especially in a European framework. The implementation of this concept in a publicly accessible Internet portal offers practical support to the users of quality approaches. The portal also provides the information basis for a discussion within a European *Community of Quality* that will lead to a reference model for quality in the educational field.

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Authors

Ulf-Daniel Ehlers
University of Duisburg-Essen, FB5
Information Systems for Production & Operations Management
Universitätsstraße 9, D-45141 Essen
uehlers@wi-inf.uni-essen.de

Barbara Hildebrandt
University of Duisburg-Essen, FB5
Information Systems for Production & Operations Management
Universitätsstraße 9, D-45141 Essen
bhildebrandt@wi-inf.uni-essen.de

Dr. Jan Pawlowski
University of Duisburg-Essen, FB5
Information Systems for Production & Operations Management
Universitätsstraße 9, D-45141 Essen
jan.pawlowski@wi-inf.uni-essen.de

Sinje Teschler
University of Duisburg-Essen, FB5
Information Systems for Production & Operations Management
Universitätsstraße 9, D-45141 Essen
steschler@wi-inf.uni-essen.de

ISSUES OF INTERFACE

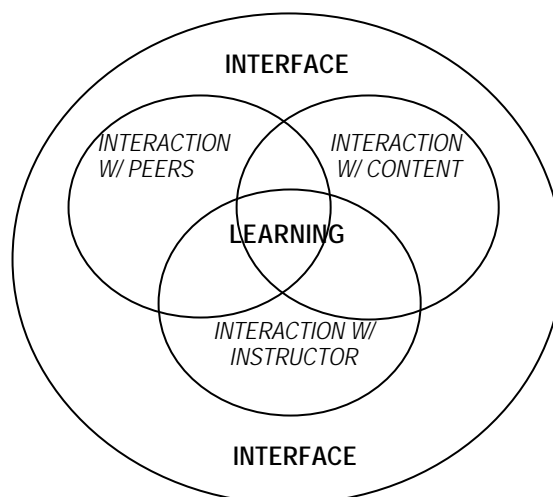
Karen Swan, Kent State University

Introduction

In 1989, Michael Moore [1] identified three kinds of interactions that supported online learning -- interaction with content, interaction with instructors, and interaction among peers -- which have proved useful constructs for thinking about online learning up to the present. Not long thereafter, Hillman, Willis, and Gunawardena [2] noted that new and emergent technologies had, at least temporarily, created a fourth type of interaction, learner-interface interaction, which they defined as the interaction that takes place between a student and the technology used to mediate a particular distance education process. Interface thus refers to specific technologies, platforms, applications, and course templates students must use to interact with course content, instructors and classmates (Figure 1).

Ten years later, interfaces no longer represent the kinds of barriers to interaction they once did, but it is becoming increasingly clear that interactions with interfaces significantly afford and/or constrain the quality and quantity of the other three interactions [3]. Swan, Bowman, Vargas, Schweig and Holmes [4], for example, developed a user-response model of the ways in which people make sense of electronic texts based on rich observations of students searching them for information. Their grounded research found that, unlike printed texts which most readers interpret singly, users engage electronic texts at three levels, each of which affect meaning making -- the content or page level, the design or website level, and the platform and browser level. These last two levels represent issues of interface. Students not only needed to navigate and make sense of each of these levels before they could process content, but how they interacted with platforms, browsers and the structure of particular websites affected the meanings they eventually developed from the content of those websites.

This paper will review educational research and explore issues concerned with students' interaction with course interfaces and the ways in which these affect student learning. It will do so in terms of the mediating effects of course interfaces on the three types of interactions described by Moore [1] -- interaction with content, interaction with instructors, and interactions among classmates -- and in so doing provide good evidence of the need for significant new research on issues of interface.



*Figure 1: Interaction with Interface Conceptualized
Swan, 2003*

Interface Issues and Interaction with Content

Interaction with content refers to the learners' interaction with the knowledge, skills and attitudes being studied. In general, this has to do with the learners' interaction with the course materials. It is thus primarily concerned with course design factors. These, of course, include course interfaces. Measurement of online content learning has been undertaken in terms of performance (course grades, exams, written assignments, etc.) and perceptions of learning by students and faculty. Most of this research has involved comparisons of learning online with learning in traditional classrooms, and most of that has found no significant differences in learning outcomes between the two modes of learning [5, 6, 7].

Some of this research, however, has looked at specific interface issues. For example, pioneering research on online learning demonstrated that the structure [8], transparency [9], and communication potential [10] of course designs heavily impact students' learning. Swan, Shea, Fredericksen, Pickett, Pelz, and Maher [11] examined the relationships between course design factors and students' perceived learning in 73 different online courses and found significant correlations between the clarity, consistency, and simplicity of course designs and students' perceived learning. These findings suggest both a constraint of asynchronous online environments and a way of ameliorating that constraint. Because real-time negotiation of meaning is impossible among instructors and students separated by space and time, clarity of meaning is more important in online classes. Consistent, transparent, and simple course structures add to such clarity as well as insure that learners only have to adapt to course structures once.

A growing focus in research on the effects of interface and interface design on online student learning involves the use of a variety of media to deliver course content. Researchers, designers and practitioners are beginning to ask what combinations of text, pictures, animations, audio and video best support student learning. Richard Mayer [12] has been studying these issues for the past fifteen years in experimental studies of students' understanding of how scientific systems work. In over 20 separate investigations, Mayer and his colleagues meticulously tested the multimedia conditions which resulted in the greatest transfer of learning from differing presentations of scientific explanations.

For example, they randomly assigned students to interact with two versions of a computer-based explanation of the phenomenon of lightning, one in which animations were accompanied by textual explanations and one in which the same animations were accompanied by audio narrations. Student performances on tests of their ability to transfer their understanding of lightening were compared between groups and significant differences favoring animation with narration were found. Mayer made similar comparisons of differing combinations of media and variations in multimedia presentations and replicated his results multiple times in all cases. Findings from this work are summarized in Table 1 which shows both research results (research effect) and practical applications of the findings (design principle).

Chi-Hui Lin [13] reports similar results, in similar experimental studies of the effects of differing multimedia presentations on student learning of mathematical concepts. In particular, Lin found that students given animated representations of concepts outperformed those shown video. This work also provides an intriguing glimpse into interactions between interface design and students' epistemological beliefs and their effects on attitudes toward learning. As online courses and online development packages are including a greater variety of media all the time, further research of this kind seems particularly useful and timely. In particular, research on the effects of differing media representations on different kinds of learning, for example support for collaborative learning, or the learning of differing kinds of knowledge, might be particularly useful,

	RESEARCH EFFECT	DESIGN PRINCIPLE When designing multimedia, . . .
MODALITY	better transfer from animation and narration than from animation and text	. . . present explanations of animations in spoken form.
CONTIGUITY	better transfer when narration and animation are presented simultaneously rather than sequentially	. . . present narration and animation simultaneously.
MULTIMEDIA	better transfer from animation and narration rather than from narration alone	. . . provide narration for animations.
PERSONALIZATION	better transfer when narration is conversational rather than formal	. . . present narration in a conversational style.
COHERENCE	better transfer when irrelevant video, narration, and/or sounds are excluded	. . . avoid extraneous video and audio.
REDUNDANCY	better transfer from animation and narration than from animation, narration and on-screen text	. . . do not add text to presentations involving animations with narration.
PRETRAINING	better transfer when explanations of system components precedes rather than follows a narrated animation	. . . begin explanations with concise descriptions of system components
SIGNALING	better transfer when different parts of a narration are signaled	. . . include signaling that identifies the organization of the presentation.
PACING	better transfer when the pace of presentation is learner controlled	. . . allow the learner to have control over the pace of the presentation.

*Table 1: Effects and Principles of Multimedia Design
adapted from Mayer, 2001*

Other research on the effects of interaction with online interfaces involves the design of particular interfaces. For example, Chang, Sung and Chiou [14] investigated the efficacy of a hierarchical hyper-concept map (HHCM) interface compared with a simple hierarchical navigation system and a linear course presentation for supporting junior high students' learning of computer concepts. Dependent measures included a test of computer hardware achievement (CHAT) and logs of time students spent using online materials. The HHCM group scored significantly better than the linear group on performance measures, and took significantly less time reading the materials than students in either the linear group or the hierarchical navigation group. The authors thus maintained that students learned faster and slightly better from the HHCM interface.

Similarly, Gutl and Pivec [15] explored the efficacy of a Virtual Tutor (VT) application for scaffolding the problem solving of undergraduate computer science students. The VT combined capabilities for multimedia representation with an expert system to provide guided support for solving computer science design problems. The authors compared the problem solutions of students randomly assigned to work either with the VT or using traditional print resources. They found that all the VT students provided correct solutions to a transfer problem, whereas two of the students who worked with print materials provided incorrect solutions and two provided incomplete solutions. In addition, students working with the print materials experienced time problems, while students working with the VT did not. The authors argue that the results show that students solved problems better and faster using the Virtual Tutor.

The results of these studies of particular interfaces may suggest ways in which interfaces can be designed to better support student learning. It is also important to note that the interfaces advocated in both studies exploit the unique capabilities of computing environments. Further research of this sort

will add to our knowledge of how we can better design course interfaces to support learning and is certainly indicated.

Interface Issues and Interaction with Instructors

A second type of interaction in online environments occurs between learners and their instructors. In any educational setting, the instructor serves as an expert who plans instruction to stimulate students' interests, motivates their participation in the learning process, and facilitates their learning. The relationship between instructor/student interactions and learning outcomes has been well documented in traditional classrooms. A similar relationship has been found online [11, 16, 17, 18]. Recent work by Shea [19], in particular, has demonstrated significant relationships between a variety of measures of teaching presence and perceived learning in a very large and diverse population.

Two studies that explored both positive and negative influences on learning of interfaces also deserve mention. Both studies compared instructor provided feedback on assignments with web-based model comparison types of feedback. Riccomini [20] investigated pre-service education students' application of behavior-analysis and instructional-analysis skills on criterion tasks after receiving either instructor-delivered corrective feedback on a similar task or being directed to a web-based exemplary model that students had to then compare with their own solutions to the task. Riccomini used an experimental, counter-balanced design in which students were randomly assigned to groups who received one type of feedback for one of the tasks and the other type of feedback on the other. He found that students receiving instructor delivered corrective feedback significantly outscored students using web-based model comparison feedback on both tasks.

Researchers at Michigan State University [21] made a similar comparison of instructor-delivered and web-based assignment feedback. They compared the performances of undergraduate physics students using an instructor supported discussion forum for help with assignments with the performance of students using a third party website where assignment solutions were given. This is an interesting study because it examines learning from real-world, web-based applications. The Michigan State physics department created a program to generate individualized homework assignments. In response, former students created a web application that generated answers with explanations to those problems. This study compared the performance of students using this third party site for help with their homework with the performance of students who took advantage of an instructor supported discussion site where they could get help on their homework from graduate assistants (GAs). The researchers further distinguished between students who posted to the instructor supported discussion, and students who just read those discussions. Using correlational analyses, they examined the relationships between the use of each of the online homework support sites and students' grades on homework, quizzes, and midterm and final exams, with the effects of aptitude (operationalized as composite ACT scores) partialled out. They found positive correlations between posting to the sanctioned site and grades on homework, midterm, and final exams, and between visiting the sanctioned site and grades on midterm and final exams. Interestingly, there was a negative correlation between just visiting the sanctioned site and homework grades. On the other hand, there was a positive correlation between using the third party site and homework scores, but negative correlations between using that site and grades on quizzes, midterms, and final exams.

The results of this and the previous study indicate that web-based explanations of homework may not support conceptual learning without instructor interaction and feedback, at least with undergraduate populations. These thus may argue against certain kinds of automated interfaces. Further research in this area could prove fruitful.

Interface Issues and Interaction among Classmates

Socio-cognitive theories of learning maintain that all learning is social in nature and that knowledge is constructed through social interactions. Online education seems particularly well situated to support such social learning because of the unique nature of asynchronous course discussions. Many researchers have found that students perceive online discussion as more equitable and more

democratic than traditional classroom discourse [22]. In addition, because it is asynchronous, online discussion affords participants the opportunity to reflect on their classmates' contributions while creating their own, and on their own writing before posting it. This tends to create a certain mindfulness and a culture of reflection in online courses [23, 24, 25].

A great deal has been written on online discourse. Some of this work looks anecdotally at media issues, examining the best uses of synchronous vs. asynchronous discussion for example [26]. This work seems to suggest important issues for serious further investigation. Most of the research, however, examines asynchronous online discussion, and implicitly views online discussion as not influenced by interface issues other than its asynchronous nature. Particularly compelling research contesting such implicit assumption can be found in Jim Hewitt's [27, 28] studies of patterns of development in online discussions. Hewitt's work questions the implicit assumption many of us hold that discussion threads develop solely according to course requirements, students' needs and interests, and instructor facilitation.

In a large scale analysis of the online discussions of 92 graduate students enrolled in five asynchronous online courses, Hewitt [27] examined patterns of interactivity in 673 multi-message threads. For example, in a four message thread, he identified six possible patterns across time (Figure 2):

- A. a posting and three responses to that posting (depth of 2)
- B. a posting, two responses to it, and a response to the second response (depth of 3)
- C. a posting, a response, and two responses to that response (depth of 3)
- D. a posting, two responses to it, and a response to the first response before the second is posted (depth of 3)
- E. a posting, two responses to it, and a response to the first response after the second response was posted (depth of 3)
- F. a posting, a response to it, a response to the response, and a response to it (depth of 4)

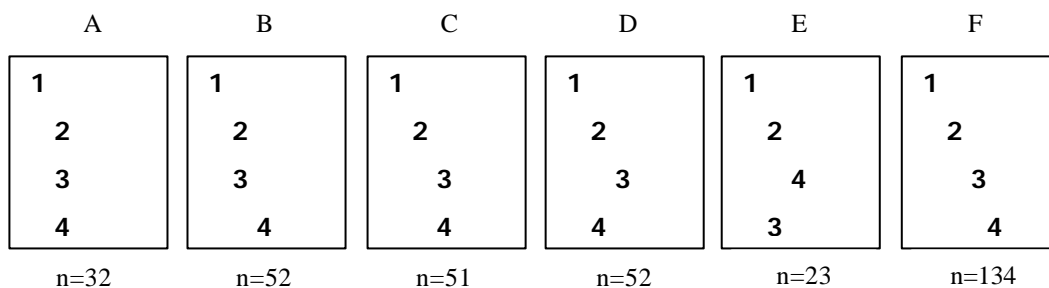


Figure 2: Frequencies of Patterns of Interaction in Four Message Threads
adapted from Hewitt, 2003

Hewitt examined the frequencies of these various patterns. All things being equal, one would expect to find an equal distribution of these patterns. Instead, out of 342 four-message threads, Hewitt found 134 were in the elongated pattern (F), whereas only 32 were in the truncated pattern (A), and a mere 23 were in the late response pattern (E). The remaining threads with a depth of three (B, C, D) occurred either 51 or 52 times. Hewitt attributes these disparities in the frequencies of occurrences of patterns of interaction to students' habits of participation in online discussions, habits he maintains are encouraged by the design of discussion interfaces to flag unread notes. Indeed, when he investigated user logs, he found that most students (97.6%) read messages before they posted messages, read only messages flagged as unread (82%), and tended to respond to messages that were less than 48 hours old (80%).

In a follow-up study [28], Hewitt found that these patterns of interaction could be replicated using a Monte Carlo simulation based on nothing more than typical rates of reading and posting messages and a rule which stated that only messages flagged as unread would be responded to. He thus concludes that patterns of interactivity in online discussion are governed as much by what notes are flagged

unread at any particular time as by course requirements, students' needs and interests, or perhaps even instructor facilitation. This practice, clearly resulting from interfaces that flag messages as unread and that only display a single message at a time, favors elongated threads and discussions he characterizes as growing like forest fires, at the edges. The problem with this, he observes, is that potentially interesting and important threads are unintentionally abandoned, and that unintentional changes in topic occur, resulting in disjointedness and discussions that are often peripheral to course content. This issue clearly deserves further investigation, especially investigation concerning alternative representations of online discussion.

Conclusions

Hewitt's work clearly demonstrates the impact course interfaces can have on learning online. There has long been a dispute in the field of educational technology, epitomized by the ongoing debate between Richard Clark [29] and Robert Kozma [30] in the late 1980s and 90s. Clark argued that findings of significant differences between technology-based and traditional interventions resulted not from media effects but rather from better designed technology-based instruction. Media, he maintained, were like trucks, they were delivery vehicles and no more. What mattered, according to Clark, was the quality of instruction, not how it was delivered. Kozma challenged Clark's position. He conceded the importance of instructional design, but argued that media mattered too. All media, Kozma argued, particularly support specific kinds of instruction and are less supportive of others. Media afford and constrain different kinds of learning simply because they mediate, they are necessarily between, instructional interactions. In online learning, the primary vehicle of that mediation is the course interface. The research reviewed in this paper quite clearly shows that interfaces matter. The notion surely deserves serious, specific, and rigorous investigation.

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Author:

Professor Karen Swan
Research Center for Educational Technology
201 Moulton Hall, Kent State University
Kent, OH 44242
kswan@kent.edu

MODELS OF STUDENT SUPPORT WITHIN THE UNIVERSITY OF LONDON EXTERNAL PROGRAMME: HISTORICAL DEVELOPMENT AND FUTURE EVOLUTION

Richard Arnold, University of London

Introduction

The University of London has an interesting, if somewhat convoluted, record of providing opportunities for External Students to obtain qualifications without their having to be present in London. It has a longer history than perhaps any other University of dealing with students who might be broadly defined as „studying by distance learning“, and it has sought various solutions to the problems of providing support to these people. Different answers have emerged at various stages of the University’s development, some of which have evolved and are still in operation today. As a result, the University of London External Programme thus provides a useful example of how an institution may operate different mechanisms of student assistance simultaneously. There now exists the potential for a widely ranging debate as to how the External Programme might move forward.

Historical Background

To go back, briefly, to the beginning. As Harte (1986) notes, when the University of London received its first Charter, in November 1836, it represented a compromise between various facets of English society, religion, government, and educational establishment. London was only the third University to be established in England, as an alternative, rather than a rival, to the medieval institutions of Oxford and Cambridge. Its early glory was its waiver of any religious requirements for its graduates: for the first time in England, a University education was theoretically open to anyone, and entry was not dependent on adherence to the tenets of Anglicanism. The new University also matched the mood of the time; its market was the „middling rich“ of a fast growing city, who would previously have been excluded from a university education on the basis of class, if not of creed. More than forty years later, London became the first British University to admit women to its degrees.

But a crucial part of the compromise which allowed the University to come into existence was a deliberate restriction of its function. An earlier „University of London“ had been founded as joint-stock company in 1828, on the Gower Street site that would become University College. A rival institution, King’s College, was opened in 1831. The creation of a University of London was an attempt to subsume these competing elements within some kind of coherent whole. The University was chartered to conduct examinations and award degrees, to students who had received teaching at University College, King’s, and a number of medical institutions in London. The functions of teaching and examination were thus separated at a very early stage in the University’s history.

With its role restricted to defining syllabuses, conducting examinations, and awarding degrees, the University did not have a large staff, and was not offered spacious premises. However, it grew rapidly in terms of numbers of degrees awarded by affiliating with other institutions, particularly medical schools, which wished to prepare their students for the University of London degree. For the first two decades of the University’s existence, students who wished to sit for its examinations needed to be issued with a certificate by one of these affiliated institutions. The pattern of affiliation was allied closely to the growing railway network, and, subsequently, to the expansion of Empire: a secondary Charter of 1850 allowed institutions throughout the British colonies to be recognised for the purposes of offering students for the London degree.

A key turning point came in 1858, when the requirement that candidates should present a certificate of study at an affiliated institution was retained in the case of medicine, but dropped for all other

examinations – which effectively opened up the University to students from any feasible location. The University Colleges, which continued to provide teaching within the capital, expressed considerable disquiet with regard to this development, which they interpreted as a dilution of the London degree. The Principal of King's remarked sourly, as this move came about, that the organisation was „not a University, and not of London“ (Rothblatt, 1988). It was, alternatively, possible to interpret the new structure as representing a National - or even an Imperial – University, with its headquarters in London.

So, by 1858, different models of student support were already starting to emerge – though none were actually provided by the University itself, which remained restricted to defining syllabuses, organising examinations, and awarding degrees. Full time teaching in London was carried out at the University College campuses, and at the medical schools. Affiliated educational institutions outside London, and abroad, provided courses leading to the award of the University of London degree. After 1858, students had the option of preparing themselves for the degree, with or without seeking assistance from an affiliated institution. The relaxation of the affiliation rule in 1858 also offered scope for private operators to provide their own routes for students to progress to a London qualification. The most dynamic of these entrepreneurs was, as de Salvo (2002) describes, one William Briggs, who established the University Correspondence College (UCC), in Cambridge, in 1887. UCC was a carefully structured operation, tailored to a key market – teachers, who could double their salary by obtaining a University degree – and making full use of the cheap and expanding postal network. By 1895, UCC had gained considerable success in recruiting teachers in Britain, and was also attracting students in Australia and Canada. Briggs, a flamboyant and dedicated individual, drove forward his creation with pride and commitment and set tough standards for both students and tutors, resulting in high pass rates for UCC participants and some measure of embarrassment for the University Colleges. Summer schools and evening classes formed important components of what was a rigorous study regime. Dismissed as „cramming“, in some quarters, and derided by much of the traditional academic establishment, UCC could nonetheless point to substantial success on the basis of its internal work ethic. Eventually, the College would prove unable to survive the death of its founder, nor the substantial twentieth century changes to teacher education which drained its core market, but it can be argued that the principles upon which the College operated can still be traced through to parts of the present University of London External Programme. UCC also provides a useful early example of how the External operations of the University have provoked tensions within its evolving federal structure.

By 1900, another Act of Parliament had given the University a role in controlling the teaching and research within the University Colleges – and the number of Colleges was increasing, with the London School of Economics and Imperial College being amongst the new members of the Federal University during the first two decades of the twentieth century. There was some questioning at this stage as to whether the University's External and Internal missions were compatible. Numbers of External Students are unrecorded before 1932, as they were not required to register with the University before that point, but there was sufficient demand for entrance to the University's examinations for the External aspect of the University's identity to be maintained. Additionally, following the Second World War, London played a nurturing role by developing partnerships with several colonial university colleges, in Africa and the West Indies, which were on their way to becoming Universities in their own right (Pattison, 1984). The model of recognised overseas institutions providing local preparation for students attempting to obtain degrees from the University of London continued well into the second half of the twentieth century.

Present Situation

Between 1960 and 1985, however, the number of External Students had dropped from 26,593 to 16,948, and a decision was taken in 1972 to cease the registration of such students via public educational institutions, and to enrol them only on an individual, private basis. There were moves to close the External Programme altogether, but the weight of its history within the University, and the idea that London had some form of special External „role“ or „duty“, won a reprieve. Since 1986, the External Programme has drawn heavily on the experience of the Open University, and has placed increased emphasis on providing support for learners on an individual basis. Around 28,000 External students are now registered with the University of London. During the same period, central control of

teaching was relaxed considerably, with the Colleges developing a powerful role in organising (though not awarding) degrees (Thompson, 1990). It might be argued that the name of the University of London now carries more weight with, and has more meaning for, its External Students, rather than for Internal Students who are registered with increasingly independent Colleges, some of which may be on the verge of seeking University status themselves.

With the External Programme, the current situation with regard to student support demonstrates a broad difference between the models used at undergraduate and postgraduate levels. Although the terms are neither official nor exact, it is perhaps a useful shorthand to specify „undergraduate“ and „postgraduate“ models as exemplifying two different forms of delivery. Each approach has its own strengths, weaknesses, and unfulfilled potential.

Undergraduate students register directly with the University, and receive an introductory package, including a student handbook, and a study guide for each unit that they are planning to undertake. They are required to purchase the relevant textbooks separately. They also have the option of buying teaching from a local institution which offers to support them in obtaining their chosen qualification. Currently, around 75% of undergraduate students – about 19,000 in total – choose to attend supportive courses run by 118 institutions, in 31 different countries.

A minority of these institutions engage in formal contracts with the University of London External Programme, which involve written agreements and inspections of services and resources. Arrangements of this kind, particularly in Hong Kong, Singapore and Malaysia, are well developed, and have proved effective in delivering local support to large groups of students. However, linkages between the majority of local institutions and the University are looser; in these cases, there is no formal system of contracting, and no fees are paid to the University by the organisations concerned. The University takes no responsibility for the quality of teaching provided in these informal circumstances, and does not necessarily endorse the institutions which offer support for its degrees – but neither does it dissuade students from purchasing this form of additional local assistance.

Though the administrative mechanisms have somewhat altered, there are clear reminders, in the principles of this system of student support, of the traditions of the External Programme stretching back to the nineteenth century. There are parallels between, for example, the London School of University Studies (www.londev.co.za), presently based in Johannesburg, and the nineteenth century University Tutorial College „perhaps best described as a successful crammer“ (Bell and Tight, 1993). The option of purchasing local support is, undeniably, still very popular. It allows students the chance to participate in face to face teaching sessions, and to be part of a group, without having to come to London in order to do so. It is also a considerably cheaper model than anything which is based on the supply of learning materials in full and the provision of support on a remote basis. It is not distance learning in the „purest“ sense of the term, in that students are tied to a fixed location, although not to London. There are potential quality control risks over local teaching – just as Briggs’s UCC spawned a number of unscrupulous and inferior competitors, there exists the possibility of fraud in places where regulation of teaching is poor or non-existent. And, as in the 1890s, there remains a certain amount of academic elitism, which holds that teaching performed outside London by institutions which are not universities, cannot be considered to be equal to the service delivered on campus.

Most of postgraduate qualifications delivered via the University of London External Programme make use of a different model. Students are usually provided with the bulk of the materials which they will need to complete the programme, and will not normally be required to purchase additional textbooks or other resources. Increasingly, they will be given access to online journals. Tutorial support is provided at a distance, either by post, e-mail, or via a web site. This mode of delivery is far more geared to the needs of individuals who travel frequently, who live in places where no local teaching is available, or who are not able to attend face to face classes on a regular basis. The provision of support in this way allows for some increase in flexibility, in terms of when and where students study, and does not restrict participants to particular location. The disadvantages include an increasing dependence on technological connectivity, which may not always be available to all potential students; a reported tendency towards feelings of isolation from students who are studying very much on their own; and, perhaps most critically, the increased expense of this style of presentation. The first two problems can

usually be diminished, if not resolved altogether, by co-ordination and advice provided by the External Programme. The third issue, however, is fixed. The University's postgraduate qualifications will cost students, on average, at least ten times as much as the undergraduate degrees and diplomas.

In some ways, this dual system of cost/delivery makes sense in terms of the age structure of the London External Programme students. Undergraduates will usually be younger, and in employment terms will probably be at the beginning of their careers. They are likely to be living with their parents, will have fewer resources to expend on studying, and will probably not have acquired the discipline and dedication that is needed for individual self-directed study. Whilst they will have to find additional fees to pay for local support, these costs are far less than those that would be levied if the University itself was to provide direct support for these programmes. Postgraduate students, on the other hand, tend to be more experienced professionals, who have already gained university qualifications. They are less frequently interested in face to face participation, and are better placed to meet the fees required by qualifications supported directly by the External Programme. In terms of the average student „life cycle“ there is an inherent logic in the way the two modes of support are structured and costed.

However, there are also some problems with both models of student support. To begin with, the undergraduate version leaves around 6,300 students – about 25% of the total number – studying on their own, without access to online resources and direct tutorial assistance, nor with access to local support. It is easy to understand how students who fall into this category might well regard themselves as being disadvantaged, and to feel that they are competing at examinations with people who have been better supported during their studies. If the growth of the undergraduate programme is conditional upon the availability of local institutions, then there are always going to be geographical restrictions imposed. Such institutions are usually found in large cities where the potential market is of sufficient size to justify the offering of supportive courses. Rural areas are vulnerable to exclusion from this model, as are large potential markets – such as North, Central and South America – where the concept of local institutions supporting the London External Programme has not really taken root. Additionally, it is the case that by no means all institutions will support all the available qualifications: the BA in Geography, for example, can only offer the possibility of institutional assistance in the UK and the West Indies. Equally, as mentioned previously, there are possible quality problems in relation to the provision of local support. The University of London has no control over, and takes no responsibility for, the activities of most local institutions, and has no direct power to prevent any particular college from offering to prepare students for the University's examinations, even when students report unsatisfactory experiences. Finally, another potential threat is that a low cost model of this kind is fairly straightforward to replicate. Other universities would have little difficulty in identifying and targeting institutions which are involved with the London External Programme, and if an educational product were introduced which was perceived as being superior, or cheaper, then important core markets could be eroded very quickly.

The postgraduate model has been run with reasonable success since 1987, when it began life as the „Independent Guided Study scheme“. It represented a conscious attempt to break with the traditions of the External Programme and to engage more readily with modern advances in distance learning techniques. Its costs have generally been around the mid-market level, and, overall, the fees for postgraduate qualifications that are provided via this method have not been out of line with those of competitors. The more recent move towards the delivery of courses via a Virtual Campus has, however, involved substantial development costs, which will eventually have to be reflected in the fees charged to students. And warnings may be sounding: a recently completed Master's degree which sought to position itself as a premium product – charging a premium fee – has struggled to recruit enough students to justify its initial development budget. There is a danger that in responding to the perceived demands of potential students for cutting-edge technological delivery, the postgraduate model may end up either by pricing itself out of any realistic market, or by operating on margins which prove to be unsustainable.

Future Developments

The policy options for future development for student support thus range between these two extremes. One approach favours a more traditional low cost/low input model, allowing the possibility of additional local support for groups of students. The other view encompasses a more technologically oriented strategy, which requires a significant level of advance investment and higher charges to students. Both scenarios have their strengths. For the moment, there is effectively an element of cross-subsidy, in that it is the proceeds from the larger undergraduate programmes that are largely being used to fund the development of the postgraduate qualifications, which are inherently less profitable. This makes some intuitive sense in terms of long term planning, in that the technology-led model may well be the key to future markets, even if it is not an immediate source of income. However, it is not currently clear whether this is a deliberate policy or an *ad hoc* response to circumstances - or how this strategy is intended to evolve in the future. One tactical difficulty may be that funds are not necessarily being channelled back to support the growth and development of the undergraduate programmes. If resources are devoted solely to the postgraduate model, which may not be in a position to generate return profits in the near future, then there is a risk that the reserves available for further development may diminish. But there is equally a danger that if insufficient investment is made in new „products“, the External Programme as a whole would then be vulnerable if there were to be any significant contraction in its core markets.

Ideally, an entirely flexible programme would allow each student the option of following courses in whatever support mode was suitable for his or her own needs. This would require the majority of qualifications to be offered in both modes, with students choosing whether they wished to purchase support locally or directly from London. Extending the idealisation still further, students would be able to switch between the two models, or even participate in both simultaneously, depending on their own particular circumstances. If the idea were pushed to its extremes, people would also have the option of completing some portion of their studies as full time students in London, if their own circumstances permitted them to do so.

Described this bluntly, the above vision would be both horrendously complicated and fiendishly expensive. However, if this ultimate objective is distilled down to its basic principles, some useful lines of guidance may emerge. The key components of this approach are flexibility and integration. The previous discussion highlights the point that these values have not always been evident in the past activities of the University of London, which have tended towards separation in purpose and function. Even with the present External Programme, the organisational subcultures required to operate the „undergraduate“ and „postgraduate“ models of student support are markedly different, and have developed varying techniques to cope with the problems which they have faced. If developmental policy can be shaped on the premise that students should have the option of buying into the programme at a level that suits their own needs, then future plans can be mapped out with this direction in mind.

It is, of course, somewhat facile simply to promote the virtues of „flexibility and integration“ without specifying the details of precisely how such policies might, in practical terms, be implemented. But there is a theoretical and philosophical leap that needs to be made, before the particular details can be worked out. It is perhaps fair to say that, throughout its history, the University of London has contained some many excellent and thoroughbred constituent elements – but that the University as an entity has always been somewhat less than the sum of those parts. A move towards integrating the External Programme’s models of student support, to provide a more flexible learning environment, would require something of break from the University’s previous patterns of behaviour. The logic, however, is that of blending rather than discarding existing traditions, and there would be strong elements of continuity in an evolution of this kind.

It is suggested, therefore, that the overall policy direction of the University of London External Programme should be towards „flexible learning“, a concept which may even come to displace that of „distance education“. Essentially, students would, for the first time in the history of the External Programme, be presented with choices as to how they might gain access to support services. If the psychological breach of functional separation can be modified, then the practical implications of

designing dual or even triple mode presentation could start to be addressed. It is certainly possible to envisage an upgraded role for the institutions, which would bring them much more closely into line with the University's operations, and which might require them to provide more in the way of local resources to students. It is equally feasible to imagine a gradually expanding Virtual Learning Environment, via which a range of support services could eventually be delivered. Overall, this proposed policy shift represents not so much a break with tradition, but a rather a merging of separate traditions into a more integrated and cohesive whole.

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Author

Richard Arnold
University of London External Programme
Learning & Development Directorate
34 Tavistock Square
London WC1H 9EZ, United Kingdom
Richard.Arnold@lon.ac.uk

THE ROLE OF DIVERSITY IN THE DESIGNING OF EFFECTIVE LEARNER SUPPORT SYSTEMS

Antonia-Maria Hartofylaka

Introduction

The provision of support to the open and distance learners is a very interesting, multi-dimensional area, which covers a significant part of the Open and Distance Education (ODE) theory and practice. Nevertheless, Robinson (1995, p.225) pinpoints that a significant amount of the research and studies based on that subject have been developed on the basis of an analogous cultural context: the formal, institutionally based higher education of the developed world. The imposition of this context has created a false “norm” and has undervalued the importance of diversity in the development of open and distance educational support.

The present paper aims to reflect on the issue of context diversity and its implications on the designing and the implementation of a learner support system in the open and distance learning (ODL) settings. Specifically, it examines the context-specific factors - the geographical, the technological, the economical and especially the socio-cultural-, which an ODL provider should take into serious consideration, when deciding about the structure of a specific system of learner support (choice of media, supporters’ roles, selection of accompanying material etc.).

In addition, this study touches upon the particular case of the internationally distributed online educational programs and the increased importance of the learner support systems for their well-functioning. Those programs are usually open to learners from all over the world, who bring their different educational, socio-cultural, religious, political or language experiences in a common pool (usually a web interface) and try to communicate with their fellow-students. In fact, this is the strength of such programs; however, this strength may easily turn out to be a weakness, if the educational effort is not backed by a culturally-sensitive learner support system, since there is always the danger of “unproductive” or even “provocative” declarations of those differences.

A. Context-specific factors, which shape the learners’ needs

Robinson (1995, p.225) remarks that the myth of “the learner”, according to which the distance learners have the same characteristics (and consequently, similar needs), is not valid. The learners are distinct personalities, with varying needs, which depend on their natural characteristics (age, gender, intelligence, physical and mental condition) and the socio-cultural ones (educational background, income, geographical position, cultural identity, ethnic and racial conscience, etc.). This paper does not touch upon the differences of the learners, which derive from natural reasons; instead, it focuses on the basic socio-cultural factors, which shape the learners’ needs, and illuminates the influence on those factors to the designing of learner support systems.

Hence, the designing of a concrete learner support system requires a situational analysis of the context, in which the system intends to apply; therefore, a preliminary research on the basic factors, which shape the identity of each context, would provide the designers with valuable information, according to which they could develop effective systems of learner support. This paper distinguishes four interrelated context-specific factors, which are directly connected to critical decisions about the implementation of learner support (choice of appropriate media, methods of support, role of the supporters, etc.).

1. Geographical distribution of learners

Robertshaw (2000 in The Commonwealth of Learning Official Website, 2003) refers to the strong relation between the communication of distance learners and their distribution over a specific

geographical area. The contrasting cases of Hong Kong and Australia highlight the connection between those two elements. In Hong Kong, 6.5 million people live within a space of less than 1,100 sq. km. In addition, the branches of the Open University of Hong Kong (OUHK) are “*accessible within 30 kilometres and one hour of transportation by road, rail or water*” (Tam, 1999). On the contrary, Australia is a vast country “*with a land mass equivalent of the United States and with a population equivalent to that of the state of Pennsylvania*” (Moore and Kearsley, 1996). Hence, due to its specific geographical characteristics, the OUHK is more likely to take advantage of the face-to-face methods in the development of its student support system, than any Australian Open University, which has to find ways to overcome the geographical constraints of the country. Naturally, the quality of the national transport and communication systems influences the effects, which derive from the geographical limitations of a region.

2. Technological infrastructure

Tait (1995, p.236) identifies the direct relation between the geographical characteristics of each country (or region, in general) and the level of its technological infrastructure in the planning of student support systems. For example, the Scandinavian countries are characterized by small populations, which are “*dispersed over a distance and isolated due to geography and climate*” (Moore and Kearsley, 1996). Even though Sudan has the same population characteristics, the lower level of its technological infrastructure implies that the African country is in need of a completely different model of student support. Hence, the provision of online support may seem a reasonable choice in the case of Sweden but would not suit in the present context of Sudan – at least when covering courses, which are addressed to the major part of the population.

The equality between learners is a crucial matter, which the designers of student support systems may find difficult to handle. Robertshaw (2000 in The Commonwealth of Learning Official Website, 2003) stresses the problem of access in the newer forms of technology, which a significant amount of people face and “*the danger of segregating students*” according to their capability - or not - to follow the rapid development of technology. The designing of a student support system, which would comply with the distinct characteristics of each context, is a significant step to the restriction of inequalities in ODE. The provision of relevant resources by the educational provider (for example computers and internet access, which could be provided through the operation of fully-equipped, study centers) would also promote equality between learners in a great degree; unfortunately, this solution is not often feasible, due to economical restrictions.

3. Economical capabilities

“*We haven’t got the money, so we have got to think!*”
(Ernest Rutherford, in Simpson, 2002, p.118)

The economical robustness of a society is strongly connected to the high standards of living, the easy access to all kind of resources and products, the rapid technological development, etc.; all those advantages normally lead to the construction of advantageous educational environments.

Nevertheless, the specific policy of each institution determines the way, in which it intends to overcome the possible financial disadvantages. As Rowntree (1992, p.175) underlines, ODL is not a “*cheap learning*”: on the contrary, it involves many different costs, such as cost of the development, academic staff, student support services, administration, marketing, etc. The present paper supports the belief that, although the dedication of money and time to the area of student support augments the budget of the educational institution in a direct way, it turns out to be a cost-effective solution in the long-term. Therefore, the deficiency in financial resources, which the low-budget institutions face, should not be confronted with curtailments in the specific area (which seems to be the most obvious and easy solution) but with the institutions’ orientation towards cost-effective solutions, which enhances the providers’ range of possibilities. A careful financial planning, which would take into account all the parameters for the implementation of a cost-effective model of student support, will rearrange the institution’s economic capacities and will provide efficient solutions.

4. Socio-cultural diversity

“While education means spreading awareness and lifting taboos, it does not mean violation of people’s customs and traditions. This must be kept in mind while planning a support system.”
(Priyadarshini, 1994, in Robinson, 1995, p.225)

I. General issues concerning socio-cultural diversity and learning

According to Hofstede (1980, in Shrestha, 1997), the variation of national cultures is connected with the following dimensions:

- Power distance: the extend to which unequal distribution of power is accepted in a society
- Uncertainty avoidance: the degree to which a society can deal with ambiguity and tolerance to deviation from the norm
- Collectivism - Individualism: Individualism refers to the degree to which one attaches values to his/her own self rather than to collectivist values
- Masculinity - Femininity: Masculinity refers to the degree to which the values are “masculine”

Granger (1995 in Shrestha, 1997) pinpoints that those dimensions influence the learning environments in a significant degree, since they construct “distances” connected to the learners’ knowledge, level of language ability, cultural background, prior skills, learning patterns and styles as well as goals and motivations, and, of course, to the environment, in which the learners inhabit. For example, there is an evident variation in the skills, which are considered to be important across cultures. The Western cultures give priority to the skills for the use of cultural tools, which are connected to literacy (for example reading and writing). In addition, children in Western cultures from a very early stage get accustomed to the widespread technological innovations, which exist in many houses; hence, the pressing of buttons, the interpretation of the visual messages of the television, even the familiarization with the computer keyboard, are common, everyday activities to them (Hebenstreit, 1984 in Shrestha, G., 1997).

Nevertheless, the acquaintance with cultural tools such as pens and books, television, household machines, etc. is not universally valid. For example, cross-cultural research has shown that the Mayan children seemed to have “less involvement with machines, but some had roles in economic activities of the adult world, such as running errands to a corner and trying to weave” (Rogoff et al., 1998). The different preferences in the development of skills derive mainly from the opposed considerations of the meaning of “socialization”. In the Western cultures, socialization aims at preparing children “for academic pursuits or to become individuals outside the ancestral culture”; on the contrary, in non-Western cultures it intends to “teach social competence and shared responsibility within the family system and ethnic community” (Nsamenang and Lamb, 1998, p.252), in order to serve the common belief that a person’s abilities are useless, if they are not used for the good and well-being of the social group (Dasen, 1984 in Nsamenang and Lamb, 1998, p.252).

II. Socio-cultural diversity and learning in ODL contexts

The cultural differences among learners are more than apparent in the ODE practice. Those differences are clearer in learning contexts, which provide learners from different socio-cultural background with the opportunity to interact with each other. For that reason, the online learning environments, in which globally distributed courses take place, form the object of analysis for many cross-cultural researches.

Kim and Bonk (2002) based on researches on the different interaction patterns among learners, which belong to different socio-cultural environments, provide us with valuable examples of those differences. Liang and McQueen (1999 in Kim and Bonk, 2002) examined the behavior among Asian and Western adult learners in an online collaborative learning environment and remarked crucial differences regarding their expectations from their tutors. Hence, the majority of the Asian students appeared to be mainly tutor-oriented, expecting direct instruction and direction from their teachers. On the contrary, most of the Western learners were peer-oriented and were seeking after the interaction with their fellow-students.

Of course, the concrete philosophy and values of the national educational systems, which form the previous educational experience of nearly all ODE students, influence the learners' behaviors in a determinative degree. Consequently, students, whose first studies are oriented to dissemination of knowledge, are more likely to attribute to their tutors the role of the content expert.

Freedman and Liu (1996 in Kim and Bonk, 2002) identified the different learning processes, which culturally dissimilar American learners showed in a series of electronic interactions. According to them, the Asian American students “*tended to ask fewer questions from either teachers or students, were less likely to use trial-and-error or experimental methods in their work processes, and they were more hesitant to being watched when working with computers than their non-Asian American counterparts*”.

The communication patterns across international students also vary. For example, in their research on the online collaboration between Finnish and American students, Iivonen et al. (1998 in Kim and Bonk, 2002) underlined the “*cultural difference in spoken and unspoken languages between Finns and Americans*”, which has been practically revealed by the larger amount of e-mails that belonged to the American students. In addition, Kim and Bonk (2002) interpret Hall's following categorization of the communication ways as a “*function of individualism and collectivism*”:

- Low-context communication emphasizes how intention or meaning can be best expressed through the explicit verbal message (and is more likely to be found among Western cultures)
- High-context communication emphasizes how intention or meaning can be best conveyed through the context (e.g., social roles, positions, etc.) and nonverbal channels (e.g., pauses, silence, tone of voice, etc.) of the verbal message (and is more likely to be found in the Asian cultures)

Thus, individuals, in a general sense, who belong in Western cultures and who “*value independence, achievement and being unique individuals*”, seem to interact in a more direct and explicit way than members of collectivistic cultures, who express their need for interconnectedness with others through their “*indirect, implicit and reserved*” communication style (Kim and Bonk, 2002).

III. The factor of socio-cultural diversity in the designing of learner support systems

The aforementioned examples show the direct connection between the socio-cultural circumstances, under which the learners live and act, with their varying positions and attitudes towards learning. Hence, they imply the need for differentiation of the support services according to the learners' distinct cultural circumstances (Robinson, 1995); in order to be effective, the ODE support services should be designed as culturally-informed and culturally-sensitive systems. As Priyadarshini (in Shrestha, 1997) states, “*bypassing analysis of learner's cultural environments can add considerable difficulty in the learning process. Providing a social context for learning is, therefore, extremely important for reaching some groups*”.

Nevertheless, practice has shown that many distance education providers plan their support systems based on their own presumptions, without taking into consideration the real needs of the learners. The reasons, which usually cause the mismatch between the students' needs and the relevant support systems can be found in either the actions of the institution, which is responsible for the development of the support services (improvised designing, improper training of the educational staff, curtailment of the expenses in the specific area) or in the institutions, which use existing – usually successful – learner support systems, without adapting them according to the specific needs of their context. In those cases, the socio-cultural values and norms of the designer prevail at the expense of the values of the “host” country and lead to ineffective support.

B. The additional value of learner support in the international online learning environments

The role of learner support in the online distance courses, which represent the 3rd generation ODL, is considered to be more integrated into the course development than ever before. The content in the

online courses is not predetermined; on the contrary, it strongly depends on the new information that the tutor and the students research and share it with all the members of the learning group. In addition, the well-functioning of the online communities requires the constant communication between members, which usually takes the form of discussion/negotiation about the course content, participation in group activities, etc. Consequently, the “online tutors” have enhanced responsibilities, since they have to deal with academic, counseling and administrative issues at the same time. Hence, tutors are no longer considered only as the content experts but as “*partners in conversations that seek to construct knowledge*” (Thorpe, 2001); therefore, they “*need even more skills of learning facilitation than the conventional tutor of a second generation distance education course*” (Thorpe, 2001). In such contexts, the borders between learner support and course design cannot be easily identified. In addition, new possibilities for support have been created, for example the student-student support. Thorpe (2001) refers to the valuable help that the ex-learners of a specific course can provide to the potential learners, who are interested in the same course, by sharing with them their educational experience. In addition, the more experienced learners (academically or vocationally) can turn out to be great supporters of their less experienced fellow-students.

Nevertheless, the most significant characteristic of the online distributed courses, which also forms one of their greatest advantages, is the ability to bring people from diverse cultures closer by creating multicultural learning communities. It is generally accepted that the multicultural collaboration adds value to the students’ learning experience, since it offers them the chance to view the world from a wider perspective. However, the achievement of constructive collaboration is not an easy task, due to the significant differences among students, some of which have been already analyzed above. In addition, the different mother tongue of the fellow-students adds another diversity, which may cause inequalities in the teaching-learning process.

The learners’ ignorance about their fellow-students’ different cultural background may lead to unpleasant circumstances, which may harm the educational environment; besides, the tendency to stereotype is common in a significant amount of people. Reid (2002) refers to the case of an Islamic student, who protested “*against the ignorance and stereotyping, which often insists that all Arabic speakers must be Lebanese, that all women who wear a scarf must be Lebanese and that all female followers of Islam must be oppressed*”.

Due to the distinct character of the internationally distributed online courses, the role of learner support seems to be more critical than ever before and certainly requires the enhanced skills and commitment from the part of the supporters. According to Kim and Bonk (2002), “*the instructors, who facilitate online collaboration among multicultural students need to be aware of cultural differences in the learners’ online collaborative behaviors and such differences need to be taken into account to foster online collaboration among culturally diverse learners*”. The gathering of information concerning the learners’ differences (language, customs, beliefs, social contexts) and the supporters’ sensitivity towards that matter needs to be developed in specific methods and techniques in order to respond to the learning difficulties of the culturally different learners (Shrestha, 1997). The constant collaboration between the supporters (of the same institution as well as of the broader ODE community), the inter-institutional support groups, and the realization of guided seminars prepared by experts in learning support systems (Randell and Bitzer, 1998, p.139) are some effective ways, in which the supporters can develop their knowledge and skills.

Conclusions

Learner support constitutes an integral part of the educational process in all educational settings. In the open and distance learning environment in particular, where the physical contact between the people involved in the educational situation is not the rule but the exception, the provision of support to the learner acquires greater importance and conforms to the general principles of ODE: **learner-centeredness, openness and equality, collaboration.**

Hence, the realization of concrete learner support systems requires respect and conformity in the diversity of the learners’ distinct needs, which, in a significant degree, are shaped by context-specific factors. The geographical distribution of the learners in relation to the transport and communication

systems of a nation, as well as its technological infrastructure and the general economical capabilities, influence the general educational environment of the learners and should be taken into account in the designing of student support systems. Furthermore, the respect in the socio-cultural diversity of the learners is another crucial factor in the development of the appropriate ODE student support services (even though practice has shown that its value has been repeatedly underestimated). Therefore, the provision of support in online learning environments, in which learners from all over the world have the opportunity to collaborate, acquires even greater significance.

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Author

Antonia-Maria Hartofylaka
MA in Open and Distance Education (OUUK)
25, Trembesinas str., P.Psihico, 15452, Athens, Greece
thellon@hotmail.com, eodem@otenet.gr

MULTIPLE MISSIONS IN INTERNATIONAL LEARNER SUPPORT: A CASE STUDY OF THE BRITISH COUNCIL

William Mitchell & Sara Knowles, British Council

British Council and educational opportunities

This paper examines the issues facing an organisation which has multiple missions in learner support. The case study used is the British Council, the main UK organisation for educational opportunities and cultural relations. British Council is represented in 109 countries with over 7,000 employees. British Council strategic objectives focus on creativity (both artistic and scientific innovation), the UK's democratic value and processes, and education (educational co-operation, teaching of English, providing learning opportunities). The organisation provides educational opportunities in many ways, leading to multiple missions in learner support.

One way in which British Council provides educational opportunities is through linking individuals to courses of study offered by UK institutions leading to UK awards (HE, Further Education, Vocational, Professional). This has traditionally been achieved through supporting recruitment of students to the UK for study. In recent years British Council has broadened this approach by linking students with UK awards in their own country. This has become possible through the increasing use of distance learning (e.g. on-line learning) and in-country delivery by UK institutions.

British Council offers educational opportunities directly through providing English language teaching (ELT). This occurs via face-to-face teaching through a network of teaching centres in over sixty countries, and provision of on-line and self access language learning facilities. It also includes supporting English teaching professionals and teaching English to young learners (ages 3 -16).

More informal educational opportunities are provided through British Council commissioned learning resources. Sector teams within the organisation (e.g. Arts, Governance, Education) are seeking to extend the impact of their face-to-face events through provision of on-line and other e-learning opportunities. Distance learning and new media provide a powerful means for British Council to expand and enhance engagement with its target audiences. These media provide sustained engagement over a prolonged period of time and overcome geographical or security constraints.

Through its network of offices, British Council has long played a role in supporting the information needs of customers with their own specific learning needs. This has been mainly through library services (dealing with enquiries, access to books) but in recent times this has focused on the provision of digital information, access to on-line learning resources and related services.

Categories of learners and learner support

A complication in trying to analyse learner support across British Council is the complex structure of the organisation. Different departments have viewed learners (and thus learner support) in quite different ways, leading to a non-integrated approach to learner support. Customers can be variously viewed as distance learners, exam candidates, teaching centre students, or independent learners. Another complication is the British Council's classification of its target audiences. Whilst helpful in identifying audiences, categories such as "young professionals" cannot usefully identify learner characteristics or the learner support required.

Possible ways of categorising learners are by subject area (e.g. ELT vs. other subjects) or by learner characteristics (e.g. adult vs. young learners). For the purposes of this paper categorisation was based on the programme of study the learner is following. A programme will belong to a certain educational

sector. Different regulatory frameworks exist for each sector with implications for the learner support to be provided. 2 categories can be identified:

- Learners studying in their own country for UK awards
 - Higher Education awards
 - Professional and vocational awards
- Learners studying British Council commissioned courses

Learners studying in their own country for UK awards

UK institutions are increasingly providing individuals with the opportunity to study for a UK award in their own country. There are estimated to be 200,000 students enrolled for UK awards delivered in their own country with another 500,000 studying for UK professional awards (not including vocational). These programmes will be delivered in different ways – through local partner institutions, branch campuses, distance learning or the Internet.

A major issue is student drop-out/retention rates. Without some degree of learner support provided during the life-span of a distance learning programme, attrition rates are quoted at an average of 75% over the initial phases of some programmes. Such high levels of attrition will obviously have an impact on the ‘quality’ label that underpins UK Distance Learning. Educational institutions have addressed this problem through provision of learner support services [1].

Learner support is used in its broadest sense to cover all aspects of the student experience that do not directly involve teaching or examinations [2, 3, 4]. For a student studying for a UK award by distance learning this can be divided into three stages: pre-enrolment; post-enrolment stage; post-course stage (see Figure 1).

Learners studying in their own country for UK Higher Education awards

With the move to distance learning there is an increasing move towards disaggregation of learner support from teaching within the educational organisation [2]. This increases the likelihood of an institution outsourcing its learner support services to external agencies. This likelihood increases even more with the problems faced by an institution having to provide support internationally. The physical presence of British Council worldwide provides a means for UK institutions to provide learner support for their international students. British Council sees provision of learner support services as a means of achieving its aim of linking individuals with UK educational opportunities.

One complication in achieving this aim was the lack of integration within British Council in relation to learner support. A range of different departments in British Council provide a variety of services that could be classified as learner support. Learner support is providing a common thread for departments to integrate services from four perspectives:

- Offering an integrated, consistent set of services for UK educational institutions
- Providing an integrated set of services to learners
- Integrating systems and processes within the British Council
- Addressing British Council staff development and recruitment needs to deliver learner support

A further issue was the range of ways in which relationships between British Council and individual UK institutions were described. Sometimes an institution was billed as being "in partnership with British Council" or courses billed as "provided by British Council". This led to a potential lack of clarity of operational boundaries and responsibilities. It could also be perceived by some UK institutions as conflicting with the British Council role as acting on behalf of the entire UK sector.

Clarity was achieved by relating learner support to the issue of course quality. Learner support is a major criterion for assessing the quality of a distance learning course. In UK Higher Education, the Quality Assurance Agency (QAA) addresses learner support through its guidelines for distance learning [5, 6]. The QAA view the institution making the UK award as being responsible for all aspects of a course (delivery, support, assessment). The delivery or provision of courses is the responsibility of the UK provider. British Council does not deliver these courses, the boundary of its responsibility extends to providing learner support services.

Learner support also helped to conceptualise the organisation's role as an organisation capable of offering international learner support services to the whole of the UK education sector.

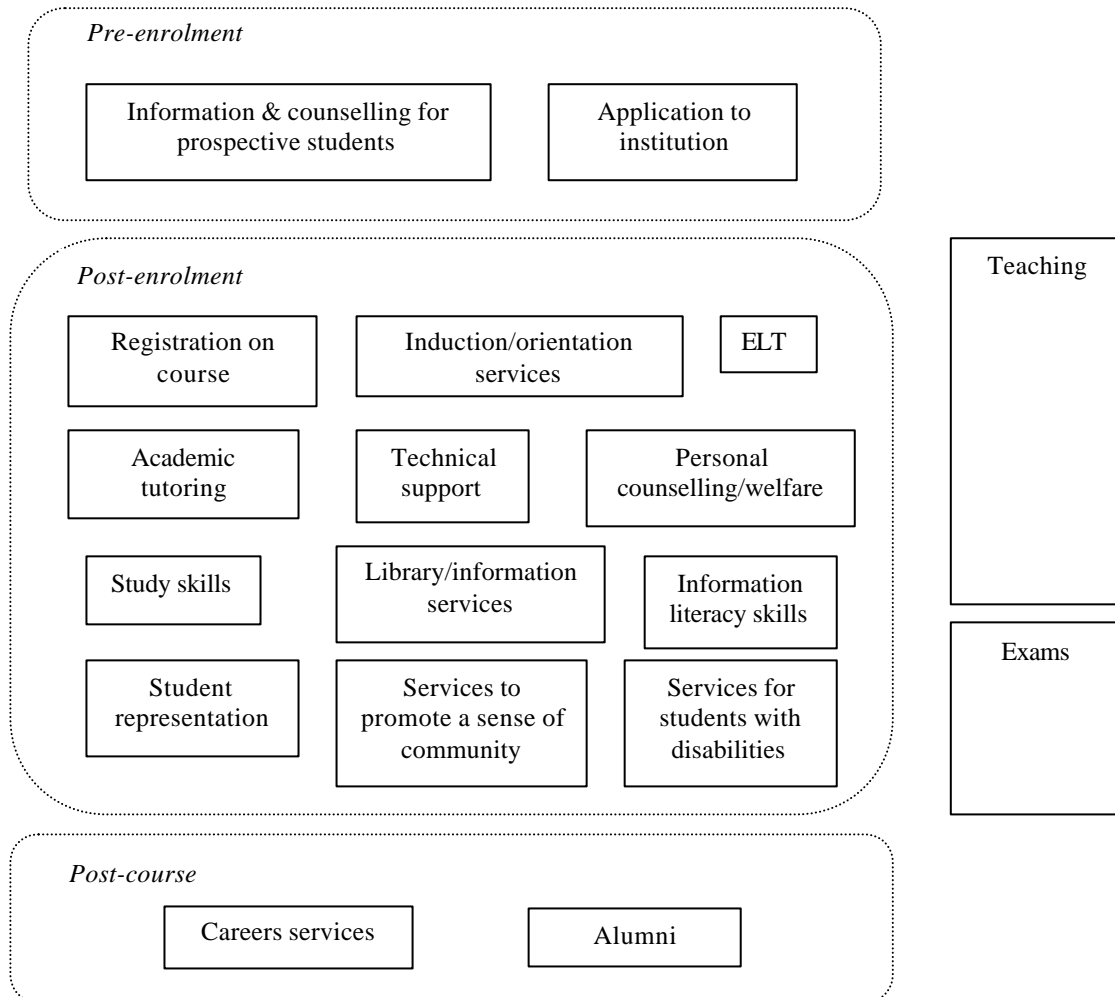


Figure 1. Learner support model for UK awards

Three main research questions arise:

- What new business/organisational models are emerging for disaggregated learner support?
- What roles do social clubs and other student community services play in the learner experience and how do these vary across the international context?
- What quality assurance mechanisms need to be put in place for the complex mix of delivery modes possible?

Learners studying in their own country for UK Professional and Vocational awards

The UK professional and vocational awards 'sector' is already a well-known and well-respected international offer predominantly consisting of examining bodies. However, the make-up is such that there is no one defining feature that enables British Council to present them as a combined international offer.

The primary mode of delivery is exam only - students are provided with a curriculum and sit for an examination. The professional awards body does not provide teaching or learner support to students (see Figure 1). This is seen as the responsibility of the student and is usually provided through private training companies, which in most cases are independent of the professional body. Learner support can thus be seen as being non-institutional. However, on-line technologies are enabling awarding bodies to extend their relationship with individual students by delivering on-line support and resources to students.

The regulatory environment differs from the HE sector. For professional awards bodies the main instrument of ensuring the quality of the student experience is maintaining the standard of the examination.

This gives rise to an additional research question:

- What is the role of non-institutional learner support mechanisms for organisations delivering via exam-only mode?

Learners studying British Council commissioned courses

The second category includes learners studying courses which have been commissioned by British Council.

British Council departments commission learning content as a means of engaging its target audience and meeting its learning needs. For example, the Arts team might commission an on-line learning resource to supplement an exhibition taking place overseas. The Governance team might decide that the best way to enhance awareness of the UK's democratic values would be through a learning resource. On-line resources in the field of management may be provided to support professional development needs.

These courses tend to be of shorter duration or "bitesized" and don't lead to an award. As British Council is the commissioner, to some extent it has more control over the learning process. Learner support can be integrated at the commissioning stage of the course and thus does not have to be separated out from the delivery and assessment parts of a course.

British Council English language (ELT) students

Students learn English for a variety of purposes and from a variety of entry levels - from beginner through to advanced. Some learn English for general purposes, to enhance their lifestyle opportunities ('leisure' learners). Many have more specific life goals in mind, such as to enhance their educational or professional opportunities, work or study in English speaking environments or emigrate. Examples include Peacekeeping English (ELT for military and other security forces in Central and Eastern Europe) or programmes for English language teachers and teacher trainers (to support the development of both their language and teaching skills).

Of rising significance is the 'young learner' group of learners, children and young people (ages 3-16). They are learners of English as a second or other language who have support needs specific to their ways of learning and interests. This group may be supported by one of the British Council's teaching centres. However, many offices that offer learner services do not have a teaching centre, and not all teaching centres offer lessons for young learners. Young learners, may, nevertheless, access collections of books and multimedia resources in a number of centres. These are often supplemented with reader development activities such as storytelling or parent/carer-child reading events.

Student learning may now involve any combination of the following methods: direct teaching (face-face class-based teaching), online learning or self access centres (see Figure 2). Each combination of methods demands different levels and types of learner support intervention by British Council. For example, self access centres provide access to printed and electronic learning resources which may be facilitated through the provision of learner pathways or guides.

The range of approaches available to the learner will vary depending on the types of services available in-country, technical infrastructure (e.g. Internet access and connectivity), and other sociological factors affecting each individual learner's ability to access learning resources.

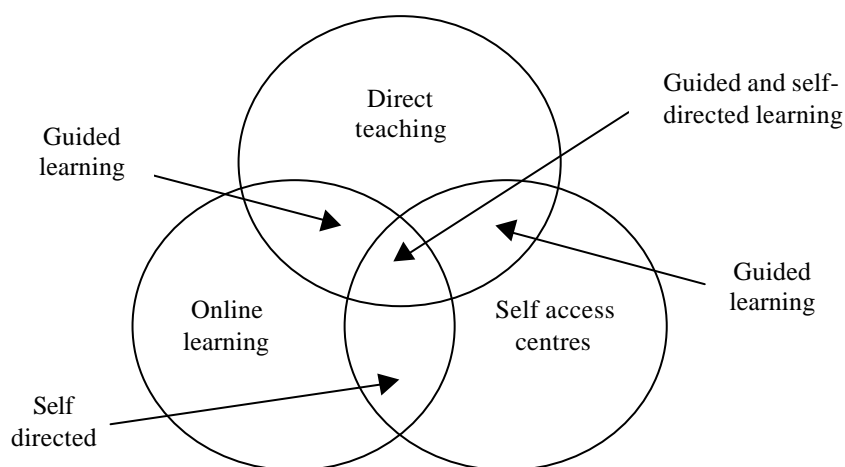


Figure 2. Learner support model for English Language Teaching (ELT) in British Council

This gives rise to the following research questions:

- Are there learner support needs that are specific to English language teaching, or are these skills generic to other subject areas?
- How do learner support needs differ between adults and children/young people aged 3-16?
- What skills are required by staff to deliver support for guided and self-directed learning?

Challenges of international learner support

The factors to consider in delivering international learner support include: the range of learner groups (young learners to adults); the range of learner support services on offer; individual learner motivation and learning style; the variety of entry levels and subject areas; and differing levels of technological infrastructure. These factors pose challenges for the delivery of learner support and the staff skills required by British Council staff.

Learning means many things to different people [7, 8, 9]. While research in this area in the British Council's context has been limited, in some cultures learning may be largely associated with personal and professional development, in others it may be primarily akin to spirituality and enhancement of well-being. Individuals' past experiences of learning will also ultimately affect their preferred approaches to learning and their expectations about the type and level of learner support required [9].

Given that many teaching and learning initiatives advocate independent learning it is worth considering the impact on learners without such experience. A paradox exists which stipulates that learners who adopt what appear to be more teacher-centred or rote learning approaches may achieve more highly than their Western counterparts [7, 11]. It is important to be clear about the purpose in using an independent learning approach and be sensitive to the preferred approaches of the individuals and provide appropriate support [12].

Within the organisation, there has been much discussion about learning content and the extent to which this should be developed or adapted to meet local target groups needs. English is more often than not a second or other language to target groups which poses challenges for the British Council as learning support providers. The implications of this for our resourcing can not be underestimated. Current online learning projects are underway that involve transmission of English language learning materials that are translated into Chinese Mandarin and Arabic, a shift change from our English language teaching methodology which has traditionally employed delivery only in English.

The implications for the organisational structure and staff are wide and far-reaching. Staff who support learners may range from those who have a background in teaching to those with library and information or other customer service roles. The question is being asked about the extent to which staff who have a stake in supporting learners should understand the learning process and be skilled in facilitating learning. Equal opportunities awareness and factors relating to preferred learning styles are key to ensuring students have a positive and effective learning experience [1, pp.160-162]. The pertinence of culturally-relevant learner support must also be taken into account [10].

It would seem prudent to adopt an approach to staff development that mirrors the methodology and experience of the learners themselves [1, pp.204-206]. In this respect, more emphasis will need to be placed on experiential staff learning delivered through a range of virtual and physical learning environments. Staff will also need to be self-aware about their own learning needs, approaches and styles, as well as being more insightful about the learning of the individuals they support. The development of job profiles together with a skills and competency framework for learner support staff is particularly pertinent.

There are also implications for internal structures and processes. These embrace factors such as staff skills and competencies, the need to develop a more customer-focussed approach to learner support and organisational restructuring. Moreover, insight is needed into the range of learning journeys that learner-customers will make. There is a need to be more astute about the markets in which we operate and the individuals we are seeking to provide a quality and enhanced learning experience for.

Conclusions

The paper examined an organisation with two quite different missions in learner support: one as a provider of learner support services to other organisations, and one as a provider of learner support for its own courses.

The paper identified research questions in 4 main areas:

- What new business/organisation models are emerging in learner support?
- What is the relative effectiveness and value of particular learner support services?
- How is learner support to be quality assured?
- What is the role of learner support in meeting differences in culture and learning style?

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Authors

Dr. William Mitchell
British Council, Distance Learning Team, Education and Training Group
Bridgewater House, 58 Whitworth Street
Manchester, M1 6BB, UK
William.Mitchell@britishcouncil.org

Sara Knowles
British Council, Learner Support Team, Information Services Management
Bridgewater House, 58 Whitworth Street
Manchester, M1 6BB, UK
Sara.Knowles@britishcouncil.org

CONVENTIONAL AND VIRTUAL STUDENT MOBILITY: FACTORS INFLUENCING STUDENT SUCCESS

Hilary Perraton, Commonwealth Scholarship Commission in the United Kingdom

Introduction

Student mobility has been a feature of academic life for many centuries. In Britain, for example, overseas students tended to form about 10 per cent of the total student body for much of the 20th century (Perraton 1997). In contrast, virtual student mobility, where students enrol with a cross-border or overseas institution on a distance-education programme but study from their home country, is a much more recent phenomenon. It has its beginnings in the enrolment of distant students, studying by correspondence, for external degrees of the University of London and others that did not require residence. But the legitimacy given to distance education by the establishment of open universities, the aggressiveness with which universities have sought cross-border enrolments in the last ten years, and the apparent opportunities presented by the development of e-learning have all stimulated its growth. This in turn has placed a new set of questions on the research agenda of which two form the starting point for this paper. First, how far is public expenditure on virtual student mobility justified? Second, if it can be justified, what measures can we take to increase its effectiveness? To find answers we need to look at the evidence both on conventional and on virtual student mobility.

Conventional student mobility

This is relatively well-documented although there are problems with the quality of some of the data. (For the background see Commonwealth Secretariat 1982-92). A recent review found that there were at least 1.4 million cross-border enrolments in 2000 (Maxey 2003: 10) while an Australian forecast suggests that global demand will increase to 7 million by 2025 (*ibid.*: 6). While the United States is the largest host country, there were in 2001/02 191,509 international students in Britain with 38 per cent of them on postgraduate courses, the main focus of this paper (*ibid.*: 50-8). The total figure has risen more than threefold in twenty years, from 56,774 in 1979/80 (CEC/UKCOSA 2000: 30).

The benefits of student mobility have also been well-argued and documented. For the sending country, and for the individual student, mobility allows access to educational resources that are not available at home. North-south, and south-south, flows of students are seen as a contribution to development, important to the north as well as to the south because of the mutuality of our interests and interdependence. British aid policy supports international scholarships because of their contribution to international development and the long-term reduction of poverty. But international students are seen as bringing other direct benefits to the host country. In an analysis of these benefits Williams differentiated between economic, educational and political benefits over and above the developmental ones. He argued that, beyond the benefits flowing to the award holder,

there are more direct *economic benefits* to Britain from educating overseas student in the UK ... [through] the potential influence of education in Britain on the subsequent placing of orders for goods or consultancy services in Britain. This is so widely believed among foreign and Commonwealth businessmen, as well as among UK expatriate managers of overseas subsidiaries of British-based firms, that even sceptics must give it some credence ... Worthwhile *educational and research benefits* to the UK may also be expected to flow from an admixture of overseas scholars in her academic community. ... Another set of benefits to Britain may be grouped under the broad rubric of *political and cultural interests*. The UK has enjoyed immense influence abroad through having educated tens of thousands of leading decision-makers from all walks of political, commercial and administrative life in their own countries. (Williams 1982: 6-8)

Any assessment of the value of conventional student mobility needs to begin by asking questions about its internal efficiency, looking at data on completion and pass rates and at the costs. But, to draw a fuller picture, we would then need to look at its longer-term effects on the sending country and, if Williams' argument is followed, also at the host country.

Figures on completion rates are encouraging. Success rates for master's students in Britain on Commonwealth scholarships have consistently been above 90 per cent while rates for doctoral students have generally matched those for internal students funded by the research councils (Commonwealth Scholarship Commission 2002: 16). The influence of Rhodes Scholarships is well attested – and publicised – while the Commonwealth Scholarship Commission has recently produced a tracer study which provides detailed information on the long-term influence of the scholars and fellows it has supported. While it is difficult to measure the economic benefits for the host country identified by Williams, in a later study of scholarship holders he found 55 per cent of respondents (a significant proportion of whom were on courses in the humanities to which the question would not have been relevant) identified equipment which they had used in Britain that would be relevant to their own institutions (Williams 1985: 177).

Two final, contextual points: first, student mobility is relatively costly. Students generally need to pay fees (although there are exceptions for students who are citizens of the European Union studying within jurisdictions in which fees are not charged). Since the early 1980s many industrialised countries have required international students to pay higher fees than those charged to resident nationals. Then students need to move and to live away from home so that costs of travel and subsistence have to be found on top of the fees.

Second, while there are many international students at undergraduate and diploma levels, student mobility is seen by many as being of particular value and importance at master's level and above. For many years the Commonwealth Scholarship Commission in the United Kingdom, for example, has limited its awards to postgraduate work. Throughout the Commonwealth, and taking account of the work of the universities of the South Pacific and the West Indies, it is both possible and appropriate for nearly all students to do their first degree within their own territory or region. Student mobility comes into its own where it can make available specialist teaching, provide opportunities for enrichment to students who have already demonstrated their potential in a first degree, and bring together an international group of students with closely shared interests. In looking at both conventional and virtual mobility this paper therefore concentrates on postgraduate courses, generally at master's level.

The record of conventional mobility sets the context for considering how one might evaluate virtual mobility.

Evaluating virtual student mobility

We can begin with four simple questions. What is happening? How many students are there and where are they studying? What completion rates are they achieving? What does it cost? Slightly more difficult, what do we know about variables that influence success or failure. Then, most difficult of all, what can we say about the benefits of virtual mobility that would allow one to compare its outcomes with those of conventional mobility?

Unfortunately we are short of information to answer even the four easy questions. While there have been valuable overviews of international experience of borderless education, particularly in parallel studies in Britain and Australia, we have limited data on current activities, numbers or outcomes (Cunningham *et al.* 1998, 2000; CVCP 2000). The Observatory on Borderless Higher Education is monitoring the situation. But the main study of British experience, for example, did not find it possible to disaggregate information about franchised, face-to-face, teaching conducted by British universities with overseas partners from that about distance learning (Bennell 1998). Whereas, through the laudable work over the years of UNESCO and more recently the UNESCO Institute of Statistics, the world is well-informed about the work of conventional higher education, we can only guess wildly at the scale of this new phenomenon. Policy makers are therefore working in the dark.

In the absence of more solid data, the publicity from providers suggests that courses in business studies and computer studies are dominating the market, as being areas in which universities have been most willing to invest development funds. It looks, too, as if cross-border enrolment may be more significant at master's than at bachelor's level. Within many jurisdictions, national open and dual-mode universities meet demands for undergraduate study. At postgraduate level there is more room for specialist courses appealing to an international audience. In Britain, for example, while the Open University has dominated the provision of courses at bachelor's level, it is the dual-mode universities, and particularly the group of former polytechnics which achieved university status in 1992, which have most vigorously sought virtual students internationally. They have tended to seek niche markets rather than offer the large-scale foundation courses that have been one of the staples of the Open University.

There are few published data which enable us to estimate the costs of cross-border learning. In a recent overview of the problems of costing e-learning Rumble set out the difficulties at length but could locate few, and disparate, data to report. One American study, for example, found development costs varying from \$6,000 to \$1,000,000 for a three-unit course (Rumble 2001: 11). Some £62 million of British government funds have been committed to an e-universities project but the economic case and business model for this does not appear to have been published, on grounds of commercial confidence. There are, however, data in the public domain which tell us the price, as opposed to the cost, of international virtual learning. The University of London, for example, charges fees for master's level courses for international students as set out in table 1.

Table 1: University of London international distance-learning fees

<i>Course</i>	<i>Fee in ££ sterling</i>	<i>Approx €€</i>
MA Applied educational leadership and management	7,200	10,440
MSc Financial management	7,290	10,570
MSc Agricultural development	7,340	10,643
MSc Health systems management	7,544	10,939
MSc International primary health care	9,500	13,775
MSc Finance and financial law	9,975	14,464
MBA	10,800	15,660
MClinDent Clinical dentistry	21,400	31,030

In many cases the figures are not significantly different from the fees charged for face-to-face, full-time, enrolment though individual students are, of course, saved the cost of travel and subsistence. The level makes it clear that the income, even from courses with, say, around a hundred students a year, can reach levels that are worth the attention of university planners and bursars. It also means that anyone responsible for paying for courses, as an employer or government or scholarship agency for example, need to be assured that the courses do provide value for money.

Data are extremely scarce on completion rates. In Britain, the Distance Learning Programme of Imperial College, Wye Campus, is probably the longest-running and most well-established programme set up to meet the needs of international students. It offers courses at diploma and master's levels in agricultural development, environmental management and related subjects and is unusual in having published an evaluation of the programme. This documents high levels of satisfaction with the programme. It notes the familiar difficulties of defining and measuring graduation rates but concludes that around 53 per cent of those enrolling for the MSc in agricultural development and 62 per cent of those in environmental management graduate (Smith and Bright 2003: 7). Many other programmes are too recent for one to be able to follow through cohorts of students; some providers have chosen not to publish, or perhaps even to calculate completion rates. This mirrors the position for first-degree programmes and national, rather than international students where researchers on distance education have generally found data to be sparse (e.g. Raza 2004: 217). Nor is this problem limited to distance education. In England, for example, the Higher Education Funding Council generally publishes completion rate data only for full-time first-degree students (although it has put a toe into trickier waters with data on completion rates for part-time modules in Wales) while the Audit Commission is quoted as finding that the ability of the further education sector to assess retention is 'significantly hampered by the quality of the available data' (McGivney 2003).

It is reasonable to assume that the variables influencing success and failure in cross-border enrolments are broadly similar to those for open and distance learning generally. Understanding of these variables would be enhanced by the development of a convincing model of student retention in distance learning (cf. Woodley 2003). (A robust model, possibly building on Tinto's work (1993), would then present its own challenges to decision makers if social deprivation were highly correlated with social and academic experiences that were predictors of inferior performance.) In the meantime there is an argument for concentrating on the variables that are within the control of a teaching institution, such as the design of teaching materials and the organisation of student support. Unfortunately, here too, we are hampered because, as Robinson has argued, 'in the literature on learner support in open and distance education, description and prescription outweigh empirical enquiry or research' (Robinson 1995: 221). While critical of the quality of the research, and warning of the danger of drawing conclusions from thin evidence, she emphasised, among the factors within the control of institutions which were likely to raise effectiveness:

- learner-institution contact, including contact with support staff and with other learners;
- the importance of the early stages of recruitment and enrolment;
- a tendency for learners to 'prefer face-to-face tutoring compared to other media';
- 'factors which correlate positively with course completion rates include the use of course assignments, early submission of the first one, short turn-round times for giving learners feedback, pacing of progress, supplementary audio-tapes or telephone tutorials the quality of learning materials and reminders from tutors to complete work' (*ibid.*: 222)

An evaluation system for virtual student mobility might well start by examining how far measures were in place to provide this kind of support, asking always how far computer-based communication could, and could not, substitute for some of the measures thought to influence student success in courses that used other technologies.

Comparative evaluation of conventional and virtual student mobility

While it would be foolish to see conventional and student mobility as exclusive alternatives, there are genuine allocation decisions to be made about the balance of resources to be used for them. Perceptions about the advantage and drawbacks of each form of mobility will also differ among such stakeholders as the students themselves, universities, employers, and funding agencies. Table 2 sets out some of the differences between them in order to suggest an approach to comparative evaluation. It is not, of course, exhaustive and some stakeholders will want to add further criteria. The Commonwealth Scholarship Commission in the United Kingdom, for example, requires the distance-learning partnerships it supports to be relevant to development objectives and, to meet its interests, questions would need to be added about the impact of both approaches on development (see http://www.csfp-online.org/hostcountries/uk/distlearn_prospectus.pdf). But, as a minimum, comparative evaluation would need to take account of these factors.

Table 2: Outcomes of mobility compared

<i>Conventional mobility</i>	<i>Virtual mobility</i>
Completion rate expected to be higher	May widen access
Total cost per student expected to be higher	Total cost and opportunity cost for student reduced because international travel is avoided and part-time study is possible
Benefits to host institution from presence of international community of students	International virtual students may create critical mass needed for course development at host institution
Beneficial externalities for host country	Partnership schemes can stimulate development of capacity in open and distance learning within distant institution
Beneficial externalities for student	

From the limited available data, quoted above, we might have target completion rates of over 85 per cent for conventional student mobility (on master's level courses) and in the range 50 to 70 per cent for virtual mobility. Once more data are available it will be possible to make the first crude estimates of the comparative cost per graduate. But, to make any sound assessment of comparative costs and benefits, we will then need to look at a number of externalities, to take account of the opportunity cost for students who can stay at work, and at home, while gaining a new qualification, and to look at both approaches in terms of the access they provide for different groups of students. In an evaluation, too, it would make sense to look at the consequences for institutions, where a range of benefits can be identified for both forms of mobility.

These calculations will not be simple. To take one example, in a programme supported by the British Department for International Development (then ODA), the University of West Indies (UWI) ran agricultural development courses in partnership with Wye College over a period of five years, at the end of which it was able to localise the courses and offer them under its own auspices. An evaluation of this kind of scheme would not only have to grapple with the comparative costs and benefits for students studying within the Caribbean, rather than in Britain, but also with the benefits of institutional development for UWI.

Alongside any summative evaluation of this kind, formative evaluation is also needed, as suggested in the discussion above. In the Commonwealth Scholarship and Fellowship Plan scheme already referred to, for example, the prospectus notes, among other criteria, that:

the Commission will wish to see a clear statement on the proposed mode(s) of delivery. It will wish to take into account past experience of distance learning on an international level and the appropriateness of the delivery method to subject area and likely local conditions. For example, what systems exist for the provision of student support and pastoral care in general; are tutorial sessions necessary and how are they conducted; and is the choice of technology appropriate for local conditions? (http://www.csfp-online.org/hostcountries/uk/distlearn_prospectus.pdf)

Thus, alongside the indicators for outcomes will be needed indicators for the process of teaching if monitoring and evaluation is going to contribute to the sound development of policy.

Conclusion

We may expect virtual student mobility to expand, alongside conventional mobility. Policies to support, monitor, and where necessary to regulate it will be needed. If these are to be soundly based, then we will need much fuller and more robust data than we have at present on the costs, outcomes and process of both forms of mobility.

Evaluation will need to look at the direct costs and outcomes, in terms of graduation rates, of conventional mobility and to seek proxies for its long-term effects and its externalities. Comparable data will be needed on virtual mobility. At the same time, in order to monitor and improve virtual mobility, formative evaluation is needed that can be used to raise its quality. Once the basic summative data are available, judgments will be needed, that go beyond economics, about the advantages and disadvantages of the two forms of mobility for students, their institutions, and their countries. This paper has sought to identify some of the kinds of data that will be needed for those judgments and for an informed debate about them.

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Author

Dr Hilary Perraton, MDE Faculty (Oldenburg University)
Member, Commonwealth Scholarship Commission in the United Kingdom
247 Hills Road, Cambridge CB2 2RP,
England
hilary@perraton.fsnet.co.uk

THE ROLE OF SCAFFOLDING IN A LEARNER-CENTERED TUTORING SYSTEM FOR BUSINESS ENGLISH AT A DISTANCE

Elena Bárcena & Timothy Read, UNED

1. Introduction

The dominant educational paradigm is still very much “instructional” in the sense that learning is viewed as an information transmission process¹. As Soloway et al. (1996) describe it: teachers have the information, learners don’t, and lectures serve to transfer the information from the teachers’ heads to those of their learners. However, there have been numerous arguments presented about the need to actively engage learners in the learning process: constructing understanding and meaning, not just receiving it.

Soloway (1997) offers a solution to the many problems of the traditional didactic instructional models in the design and development of a new set of technology-based tools. Although it could be argued that technology has not changed the core of the learning process substantially, it cannot be doubted that computer-assisted learning is here to stay. Among its appointed advantages over traditional face-to-face methods is the relative flexibility of access and usage in terms of time, space and progress, and the absence of personal relationships teacher-learner (which are not always positive and stimulating for the learner; Mueller, 2001), to name but a few. However, a common shortcoming of many of these systems is that they are not sufficiently flexible in two senses: they do not adapt to the different needs and preferences of each learner which, furthermore, typically change to a certain extent for a particular person in the different phases of the learning process. Individually customized software is, like private tuition, out of the question for the immense majority for practical reasons. Soloway claims that the best way to address the diverse needs of individual learners in their different learning stages is via what this author defines as *learner-centered technology*, which is discussed in the following section.

Throughout the last three decades of computer-assisted language learning research, different approaches have been developed, from the earliest vocabulary and grammar trainers to multimedia and Web-based workbenches that reflect the current interest in communicative intent and functions within Linguistics, and eclectic pedagogic theories and approaches including Cognitivism, Constructivism, and Scaffolding. The authors’ experience of interactive on-line language learning using such frameworks is that, although it is currently unfeasible to design the perfect tutoring system, it is possible to solve a subset of problems present in a particular domain, especially if the system is sublanguage-based, which offers advantages such as considerable quantitative reductions in the scope of the domain (terminology, grammatical repertoire, etc.), qualitative simplifications for organising the corresponding syllabus, and a positive attitude on the part of a highly-motivated learner. In this paper a system called I-PETER (Intelligent PErsonalised Tutoring EnviRonment; Read et al., 2002; Bárcena et al., 2003; Read et al., 2003), based upon the previously mentioned disciplines, is presented as a proposal for providing *flexible, individualized learner-centered tuition of business English*. I-PETER is a system for on-line distance learning in a context where a very large number of students typically restrict the teacher’s possibilities to provide individualised guidance.

This paper presents the extent to which the learner controls the system and the role played by scaffolding for providing not only effective assistance (what is needed and when it is needed), but also enhancing the learner’s cognitive skills. In the following section, a critical overview of learner-centered technology is undertaken from the perspective of the mainstream theoretical frameworks that have been adopted since computer-assisted learning started. Attention is then given to the specific concept of educational scaffolding, a recently revitalised topic that many teachers and educational

¹ This paper has been written in the context of the research project I-PETER, which is funded by the *Vicerrectorado de Investigación* of the Spanish *Universidad Nacional de Educación a Distancia*.

systems adopt to intervene in the learning process, assisting the learner mainly in the early stages. Finally, an application of some of these key theoretical principles to a personalized learner-centered system for the tuition of business English is presented.

2. Towards learner-centered technology

Over the last twenty years research in computer-assisted learning has been moving progressively towards learner-centered systems, in which the student becomes more and more the protagonist of his own learning process, as he is expected to actively search for data and information using various cognitive capacities in a complementary, creative, and inquisitive way (Verlee Williams, 1999), based upon the continuous negotiation of goals and methods with the system.

The situation was different at the beginning of the 80s, when computer-based instruction was characterized by the use of behavioral-based software that was prescriptive in nature and relied heavily on drill-and-practice to teach segmented content and/or skills. The control of the learning process passed then largely from the teacher's hands to those of the computer programmer. This was a time of inert knowledge (no reasoning or judgment was stimulated), although it could also be argued that automated learning was somewhat less passive than the traditional print-based counterpart, since it allowed learners to self-pace their movement through established lesson programs. However, research shows that learners benefited to some extent from the technology when the learning objectives were behavioural: "[programmed instruction] opened up new possibilities for individualizing instruction, for teaching diagnostically, and for providing a real school situation for the scientific study of learning" (Saettler, 1990).

Sometime later, advances in technology and learning sciences have led researchers (e.g., Berryman, 1993; Streibel, 1993) to adopt a different point of view: they see learning with technology as a valid means for building problem-solving skills and for achieving learner autonomy. Regarding cognitive psychology, Mandler (1985) makes the observation that: "the emphasis is to develop systems and structures that can be said to construct the observable, evidential aspects of thought and action." Advocates of this view propose that the learning process is about changes in learners' perception and mental structures. The analysis of such structures enables us to present learners with appropriate experiences and problems in order to facilitate the growth of their knowledge. Educational cognitivist technology has therefore shifted psychological thought and research from a focus on "procedures for manipulating instructional materials to procedures for facilitating learner processing and interaction" (Saettler, 1990). Unlike behaviorism, it is descriptive in nature and emphasizes looking at how we know rather than how we respond, and analyzing how we plan and strategize our thinking, remembering, understanding, and communicating. The emphasis is on how learners develop skills in logic, solve problems, and follow directions, all clearly higher-order thinking skills.

The cognitive approach is the starting point for the constructivist models of learning that are proliferating these days, in which learners are seen to be engaged in the active construction of their understanding and knowledge, adapting their understanding to their existing mental structures. The emphasis is clearly placed upon individual cognition; a teacher's words do not directly become engraved in a learner's mind after entering through the ear; they are interpreted and reflected upon by the learner (Lave, 1993). Constructivists believe that learners construct their own reality or at least interpret it based upon their perceptions of experiences, so an individual's knowledge is a function of one's prior experiences, mental structures, and beliefs that are used to interpret objects and events. The methods of constructivism emphasize the learners' ability to solve real-life, practical problems; they tend to focus on projects that require solutions to problems rather than on instructional sequences that require the learning of certain content skills. While the role of the teacher (and/or the system) is basically reduced to facilitating the required resources and to act as a guide to learners, who set their own goals and "teach themselves" (Roblyer et al., 1997).

Therefore, the argument is that there is currently a strong trend away from instructivist systems in favour of constructivist ones, which are seen to be clearly superior in that they attempt to present learning materials in a fashion that is closely tuned to how the learner's internal cognitive processes

actually take place, favouring comprehension, meaningful assimilation. However, designing and developing software that *truly* addresses the needs of learners is a real challenge. Since the learners are also users, all the principles of user-centered design, of course, still apply here. Easy-to-use software requires focusing on its potential users from the very beginning, and checking each step of the process to be sure they will like and be comfortable with the final version. The user-centered design process starts by identifying the target audience, and representative users are ideally recruited to work with the (multi-disciplinary) team. These users can help establish the requirements for the product by answering key preliminary questions such as: what they want the software to do for them; in what sort of environment they will be using it; or what will their priorities be then.

It is to be expected that learners have additional needs that must be addressed and incorporated in their software. Many authors have attempted to provide exhaustive lists for specific educational domains. Soloway et al. (1996), for example, succinctly summarise them under broad categories of universal applicability:

- *Growth*: the main objective of educational software must be to promote the development of expertise; it must allow the student to “learn how to do while doing”. He must also be aware of his newly acquired competence, not only as a motivational factor, but also to help integrate it into the rest of the existing knowledge.
- *Diversity*: cognitive, cultural, gender, etc. differences play a major role in the effectiveness of materials for individual learners. In order to be truly useful, software must address these differences.
- *Motivation*: in contrast to software developed for professionals, the learner’s initial interest and continuing engagement cannot be taken for granted throughout the process until the end.

3. Scaffolding

Scaffolding is claimed by many to be a key concept in the quest for a more inquisitive, individualistic learner-centered model. Although it has been around for a long time under several names, there is no appropriate definition for “scaffolding” in the educational sense. McKenzie (1999) explains the metaphor: “we tend to think of structures thrown up alongside of buildings to support workers in their skyward efforts”. Greening (1998) uses the term “scaffolding” in a wide context to refer to all forms of learning support, i.e., to the whole range of services provided to assist learning. McLoughlin & Marshall (2000) define “scaffolding” as “a form of assistance provided to a learner by a more capable teacher or peer that helps the [learner] perform a task that would normally not be possible to accomplish by working independently”. All these contributions, however, fail to emphasize what is most interesting about scaffolding: not so much what it does while the support is there, but the fact that it enables the learner continue with his learning process in an autonomous, self-sufficient manner when it is not there any more. In other words, it is crucial that the scaffolding does not imply long-term dependence on the part of the learner, which would inevitably lead to ill performance when he tries to apply the knowledge outside the “safe” context where it was learnt.

McKenzie (1999) identifies eight characteristics of scaffolding which can be directly related to learners’ requirements as presented in the previous section. Firstly, the learner’s awareness or expertise can start to “grow” through confident learning because *scaffolding provides clear directions*, that is to say, step-by-step instructions to explain what to do in order to meet the expectations for the learning activity (by means of user-friendly directions, anticipating problems or ambiguities, etc.). Secondly, *scaffolding points learners to worthy sources*, which means that confusing, misleading and unreliable information is to be avoided so that the learner concentrates his time and efforts in reasoning, reflecting, associating, analyzing, researching and assimilating. Thirdly, *scaffolding keeps learners on task*, which also basically means that by providing a pathway for the learner, he will not go astray, waste energy and become confused, all of which could eventually lead the learning process to a dead end. Fourthly, *scaffolding reduces uncertainty, surprise and disappointment* in order to try and eliminate distracting frustrations to the extent that is possible. Material designers are required to test every step to anticipate what might possibly go wrong before the material is given to the learners.

Fifthly, *scaffolding clarifies purpose*, because this way the knowledge becomes more meaningful and worthy to the learner, which is fundamental for his motivation. Boredom fed by irrelevance and ignorance will, in the best of cases, slow learner progress. Sixthly, *scaffolding offers assessment to clarify expectations*, so the learner does not have to wait until the end of the course to obtain the whole picture of what he was supposed to learn, the amount of knowledge and depth expected of him, etc. This is of great importance to many learners who find it difficult to concentrate, and hence progress, with questions coming to their minds. Seventhly, *scaffolding delivers efficiency* in that, although there is still hard work to be done on the part of the learner, focus and clarity are crucial for orientating the learner and speeding up his work. Eighthly and finally, *scaffolding creates momentum*, in the sense of interest, inspiration and provocation, through the channeling and guidance provided.

In the next section an application of some of the previously mentioned principles of cognitive theories, in particular constructivism, and the conceptual framework of scaffolding is presented in an adaptable, personalized learner-centered system for the tuition of business English.

4. The role of scaffolding in a business English tutoring system

As mentioned in the introduction, I-PETER (Intelligent PErsonalised Tutoring EnviRonment) is a system for on-line distance learning in a context where the number of students restricts the teacher's possibilities to provide individualised guidance. This section attempts to present the extent to which I-PETER adapts to various learner profiles that evolve during the process, the ways in which the learner controls the system and the role played by scaffolding in providing effective assistance and enhancing the learner's cognitive skills. It should be briefly explained that there are two differentiated parts in this system: a *diagnostic task model* which assesses student performance², taking the form of a Bayesian network, and a *selection mechanism* that proposes appropriate materials and study strategies. I-PETER contains *domain models* that represent linguistic and didactic knowledge: the conceptual framework related to linguistic levels and knowledge stages, and the educational content (mostly specific to the field of business) and study strategies. Furthermore, there is a *student model*, which represents the knowledge that the student has learnt, the study strategies adopted, and his profile.

Being a learner-centered tool, the preliminary design step was to define its learner profile. The authors' experience in the face-to-face teaching of English for Specific Purposes, and specifically for business (with multimedia and telematic materials), has led to a distinction between: the "linguists" (teachers and translators of business English) and the "economists" (with a degree in Macro/microeconomics, MBAs, etc.), both as students and professionals. They have some similarities and one difference between them. The similarities lie in the small amount of time they have for studying and the type of study sessions (frequent and short, less than or equal to an hour, two or three times a week, either in work breaks or at home in the evening), as well as their high motivation. The implications of their study pattern is that the learners of this system, being busy adults, need to have short, intense and fruitful sessions, with no frills, instruction manuals or preliminaries, to make the most of the little time they have available. Also, since they are not computer experts, they demand very user-friendly interfaces. I-PETER provides both: a division of the syllabus into small units, so that they fit entirely into brief 30 minute study sessions, which has proven to be a positive cognitive and motivational factor, and a simple, intuitive interface (button menu-based access to all tools).

The difference between the system's user profiles lies in their expertise, since the "linguists" are generally more keen on learning via grammar explanations, as they are more familiar with the terminology, etc., while the "economists" typically aren't at all, and feel more inclined towards exclusively practical exercise-based learning. The way in which I-PETER adapts the system's domain structure to the learner is through one of its models called the *student model*. This stores the information that pertains to each learner, such as his preferences and restrictions expressed in the

² One of the contributions of this system is that each student's command of business English is evaluated by interpreting his performance in terms of three related criteria (the knowledge stage [e.g., lower-intermediate, advanced], the linguistic level [e.g., lexical, grammatical] and the learning phase of the student [i.e., mechanical reproduction, non-attentive application]), rather than by a general linguistic competence ranking.

student profile module (e.g., degree of theoretical explanation [standard / minimum], learning goals [fill knowledge gap / improve knowledge stage / improve linguistic level / practise conceptual unit], initiative [student / system / mixed]) and the knowledge that the student has learnt so far. The student profile is a determining factor for the selection of the materials within the didactic model that are most appropriate for him, and selections can be accessed and partially modified by the learner at any time.

Furthermore, the system contains a *native language sequence model* which represents instructional strategies in the form of the set of sequences of conceptual units, materials, and exercises which are most appropriate depending upon the speaker's own native language (optionally selected from the student profile menu). In the authors' experience, this inevitably influences the new foreign language learning process, causing interferences, etc., and should therefore be taken into consideration in syllabus design. There is also a *log* (or record) of the learner activities and interactions with the system that represents the way in which the different materials within the system have been studied (e.g., sequence, time, results). Here the system takes into account heuristic information such as the time that has gone past since the learner last worked with this type of material and any other didactic criteria specified by the teacher. Therefore, the system negotiates the structure of the course with the user on the basis of all these elements: the default syllabus of the domain model³, the profile established in the student model and the complete log.

I-PETER is not restricted to offer linear temporised courses; as seen above, in the student profile the student can choose between different modalities according to his learning goals. Therefore, for the most part there is little scaffolding in the standard sense, following the belief that it is preferable that assistance can be called on or off according the learner's own preferences. Such is the case with theoretical explanations and error analysis⁴, and other supplementary information (see below). There are only a couple of exceptions. Firstly, I-PETER attempts to avoid the dangers of monitored practice and short-term memory learning by distinguishing two learning phases: "mechanical reproduction" and "non-attentive application", and using multiple topic-based exercises that provide extra practice and "secretly" test previously learnt items as well as the current item under study. However, no theoretical explanations are provided on any topic other than the one under study. Hence, if a mistake is repeatedly committed on a secondary, "non-attentive application" topic, I-PETER will rediagnose the learner's knowledge and probably propose him to go back and review the topic giving it more attention and time. The other aspect of I-PETER which follows scaffolding in the conventional sense is that the system provides the beginner with a series of linguistic reference tools such as hierarchically organised terminology trees, lists of irregular verbs, grammatical outlines, a notepad, etc., which gradually disappear from the screen as he progresses through the material and are only displayed again in the case of a level regression.

Learners are motivated when they view their study as personally meaningful. This is easy for most learners of languages for special purposes who, as mentioned above, are highly motivated. One of the ways to keep the learner on track in the course in I-PETER is, as seen above, making him the protagonist of his own learning process by letting him make a large number of decisions. Furthermore, the learner can complement, re-express or expand the system's theoretical explanations by using the Notepad provided and appending his own comments and examples. I-PETER also states the objectives of what the learner is about to study in such a way that he can relate to it and gain interest, i.e., not only in merely linguistic terms, but in functional extralinguistic terms, that is to say, what types of message they will be able to produce after having studied a certain topic (e.g., learning the imperatives will allow you to ask for favours and give commands). Similarly, the system informs the learner at the end of each unit and session of the potential uses of what he has just learnt and the *communication* that is now possible to establish after working on particular topics.

³ The relative order of the linguistic knowledge in the *content model* is based on standard materials on business English elaborated by English speakers for any type of learner, and is used only when the student gives full control to the system.

⁴ Errors are divided into three categories: formal or surface errors (e.g., mistakes in spelling, contraction, etc.), semantic or meaning errors (e.g., false friends, mistakes in words selection), and usage or contextual errors (e.g., wrong register and layout). The system interprets both correct and incorrect answers in order to diagnose the student's level of knowledge.

In prevision that the level of motivation on the part of the students may descend as the course goes on⁵, the challenge in motivation in language courses is to keep the spirit high throughout. This does not mean that a language tutoring system must give lots of encouraging messages to the learner randomly (receiving what could be interpreted like patronizing messages would surely put the learner off rather than keep him interested), but that the system should identify decaying interest by a reduction in the curve of number and length of sessions and react accordingly. This is not currently done in I-PETER. What this system does is have all the quantitative and qualitative information (number and length of sessions so far, list of topics learnt, fine-grained level diagnosis, curve of errors, etc.) about the student accessible for consultation in the form of graphics (which allows for the concentration of more information in less space and is visually more appealing) which can be requested at any point in the session, in the hope that it will make the student feel more involved and encourage him to continue working hard.

5. Conclusion

This paper has presented some of the key theoretical frameworks and concepts in the field of learning, and their application to a system for the tuition of business English. The starting point of the design and development of such a system, named I-PETER, was the multiple difficulties associated with the organization and teaching of crowded courses of English (and English for special purposes), in particular in adapting to the individual skills, needs and profiles of the students. The authors concur with Soloway (1997) that the answer to such problems lies with learner-centered technology. Given the various theoretical approaches followed by software developers over the years, cognitivism and constructivism have been adopted for their emphasis on the learner's mental processing, the idea of him "constructing" his own knowledge, and the various attempts within these frameworks to devise software that enhances the ways in which the learner's internal cognitive processes take place, favouring high-order mental processing. In order to achieve these goals, the popular concept of scaffolding, "putting a supportive structure up when it is needed and taking it down when it is not" is also introduced and explored in our particular study domain.

The didactic architecture of I-PETER is based upon the idea of "adaptability by student knowledge modeling", which is materialized in four of its models, namely the student model, the student log, the student profile, and the native sequence model. The learner has an enormous degree of control of his study and the power to make decisions about many of its aspects, as long as his selections are reasonable and not counterproductive. Virtually everything in the system is negotiable while maintaining its strong pedagogic principles. As for the scaffolding in the conventional sense, it is mostly seen in aspects like the amount of theoretical explanations, the supply of error analysis, and other supplementary information, both for methodological and motivational purposes.

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Authors:

Elena Bárcena
Departamento de Filologías Extranjeras y sus Lingüísticas
Facultad de Filología
Universidad Nacional de Educación a Distancia
Senda del Rey, 7
28040 Madrid (Spain)
Tel.: +(34)913986841
Fax: +(34)913986674
E-mail: mbarcena@flog.uned.es

Timothy Read
Departamento de Lenguajes y Sistemas Informáticos
Universidad Nacional de Educación a Distancia
Juan de Rosales, 16
Ciudad Universitaria
28040 Madrid (Spain)
Tel.: +(34)913988261
Fax: +(34)913986535
E-mail: tread@lsi.uned.es

EXPLORING THE LINK BETWEEN METACOGNITIVE KNOWLEDGE, EFFICIENT STRATEGY USE AND LEARNER AUTONOMY IN DISTANCE LANGUAGE LEARNING

Mirjam Hauck, The Open University, UK

Abstract

Apart from the work of Harris (2003), Hurd (2000, 2002), and Hurd, Beaven and Ortega (2001) White (1995, 1997 and 1999) there is to date, to the author's knowledge, very little recent research published about the link between self-awareness, strategic competence and learner autonomy taking into account the particular situation of distance language learners. This is particularly true with regard to the role of metacognitive knowledge and metacognitive strategies in distance language learning within virtual environments (Hauck forthcoming).

In 2003, the Department of Languages (DoL) at the Open University (OU) in the UK began a progressive move towards delivering all language tutorials face-to-face as well as online. The purpose of this move was twofold: firstly to increase distance language learners' choices in terms of learning environment and secondly to overcome the geographical challenge posed by providing tutorials for learners in locations such as the Scottish islands and Continental Western Europe. All DoL students can now opt for tutorials via *Lyceum*, an Internet-based audio-graphic conferencing system.

In my study with beginners of German and Spanish I have explored whether metacognitive knowledge acquisition as advocated by Wenden (1998a) can foster 'metacognitive growth' (White 1999) in learners. Furthermore I wanted to find out how more efficient metacognitive strategy use on the basis of Cohen's (1998) strategies instruction (SI) could potentially lead to an increase in the students' degree of autonomy in face-to-face as well as collaborative virtual learning environments (CVLEs) such as *Lyceum*.

Introduction

The OU is the UK's largest modern foreign language learning provider with a current (2003) enrolment of approximately 5000 students of French, German and Spanish, all of whom study on their own at home, at a distance from each other and from their tutors. Apart from up to 21 hours of oral practice at face-to-face tutorials per academic year these learners used to work with traditional distance learning materials such as course and grammar books as well as video and audio cassettes.

In 2003, however, DoL began a progressive move towards dual strand delivery of all language tutorials. OU language learners can now choose between face-to-face events at the university's 13 regional centres and online tutorials via *Lyceum*, an audio-graphic conferencing system developed in-house. In this online environment, students and tutors use headsets and microphones to work together in real-time, an approach which enables them to simultaneously hear each other and talk to each other, but not to see each other. Apart from the voice and web browsing facilities *Lyceum* offers a traditional on screen *whiteboard*, a so-called *concept map* (suitable for brainstorming exercises, word associations as well as any other vocabulary-building activities) and a *shared document* mode (for collaborative writing activities). A text-chat box providing limited space for additional written input can be opened to supplement the voice conferencing (for a more detailed technical description of audio-graphic conferencing tools, see Hampel & Baber, 2003).

According to White (1995) the demands and opportunities of a distance learning context make it necessary for students to re-evaluate their role and responsibilities as language learners and their need for self-direction requires them to develop a comparatively higher degree of metacognitive knowledge, particularly in terms of self- or person knowledge. Her studies also reveal that distance language

learners make greater use of metacognitive strategies than do classroom learners, self-management being the most frequently used. Apart from the work of Harris (2003), Hurd (2000, 2002), Hurd *et al.* (2001), and White (1995, 1997 and 1999), however, there is to date little research published about the link between self-awareness, strategic competence and effective learning taking into account the particular situation of distance language learners. This is particularly true with regard to the role of metacognitive knowledge and metacognitive strategies in distance language learning within CVLEs such as *Lyceum* (Hauck forthcoming). At the same time Erben's claim that audio-graphic technology "remains under-researched and under-theorised" (1999:230) is also still true.

The findings in this paper are based on data - student feedback from questionnaires - collected during a project carried out in October 2003 with learners enrolled in OU German and Spanish courses for beginners. The main aim was to find out whether awareness raising activities for metacognitive knowledge acquisition as advocated by Wenden (1998a) can foster 'metacognitive growth' (White 1999) in learners. I have also investigated how distance language learners' general use of metacognitive strategies and thus their autonomy can be enhanced by instructed self-management strategies following the principles of SI as defined by Cohen (1998).

The first part of this paper explores the concepts of metacognitive knowledge and learner beliefs as well as metacognitive strategies with regard to their particular relevance for distance language learning. The second part gives an outline of the project, looks at the rationale for the chosen approach and concludes with a preliminary evaluation of the data.

Metacognitive knowledge and its role in distance language learning

Wenden (2001:45) describes metacognitive knowledge as the "part of long-term memory that contains what learners know about learning" and stresses that it is essential to the effective use of learning strategies and thus critical to self-regulated or self-directed learning. Using Flavell's (1979) categories of metacognitive knowledge for the purposes of learner training as a guide, Wenden (1991) further distinguishes between *person knowledge* (e.g. the influence of cognitive and affective factors such as age, personality, motivation, on learning in general and one's own learning experience in particular), *task knowledge* (e.g. the purpose and the demands of a task) and *strategic knowledge* (e.g. the nature, adeptness and effectiveness of strategies) depending on whether the focus is on the learner, the learning task or the process of learning. All three types of metacognitive knowledge can be acquired consciously or unconsciously and can be activated deliberately or appear automatically depending on the nature of the learning task at hand. However, metacognitive knowledge may also and "probably does influence the course of the cognitive enterprise without itself entering into consciousness" (Flavell 1979:907-8). It seems that this aspect of metacognitive knowledge plays a crucial role with regard to distance language learners' perception of, for example, their proficiency in speaking another language, or, of their aptitude for learning another language, particularly in a virtual context. For certain language learners then, learning another language online in a CVLE such as *Lyceum* might constitute a challenge for reasons other than those they seem or believe to be aware of. They might, for example, perceive themselves as being technologically challenged whereas they have, in fact, hidden doubts as to their aptitude for learning another language in the first place. Thus, in addition to their knowledge about language learning in cognitive terms, learners usually approach their studies with their own particular beliefs, assumptions and expectations regarding both the language learning process and themselves as language learners. Such beliefs are generally held to be true and guide the learners in their behaviour. Based on her research into self-efficacy beliefs of language learners Cotterall (1995:195) reports that "the beliefs [...] learners hold have a profound influence on their learning behaviour" and that "teachers and material writers need to be [...] sensitive to students' pre-existing assumptions about the language learning process" (1999:496).

Research findings on language learners' metacognitive knowledge are often reported as information on learner beliefs (see, for example, Horwitz 1987) and Wenden (2001) contends that - although there seems to be no clear consensus on the distinctions between knowledge and beliefs - the characteristics of metacognitive knowledge as outlined above also define the nature of learner beliefs about language learning. According to Alexander and Dochy (1995) however, there are distinct differences between

both notions depending largely on the value and level of commitment learners attach to them. This lets Wenden (1998a:517) draw the conclusion that due to their “value-relatedness and idiosyncratic nature [...] beliefs would be held more tenaciously than knowledge.” The findings of this study suggest that beliefs about language learning – seen as a crucial affective component of person knowledge - require separate attention. With White (1999) we argue that the learners’ belief systems help them to adapt to new environments, to define what is expected of them and to act in accordance with those understandings. Exploring expectations and emergent beliefs of distance language learners she identifies the “learner-context interface”, i.e. the relationship between the learner and the learning environment, as the critical element of self-instruction. She contends that it is the context itself that influences the learners in new ways “to extend and develop their learning skills and knowledge about themselves as learners” (White 1999:449).

Metacognitive strategies and their role in distance language learning

Cohen (1998) defines second language learner strategies as a combination of second language learning as well as second language use strategies. In most learning strategy studies however, the term language learning strategies is used to refer to a combination of learning and use strategies. In categorising strategies, a common distinction is made between direct processing of the language – cognition - and reflecting about these processes – metacognition. The latter includes strategies for planning, monitoring and evaluating both language learning and language use: key elements in developing autonomy. Wenden (1998a:519) gives a slightly broader definition of metacognitive strategies, describing them as the “general skills through which learners manage, direct, regulate, guide their learning”. Chamot and O’Malley (1994) have made another useful distinction contrasting learner strategies with learning strategies, i.e. “those (strategies) that students have developed on their own to solve language learning problems” and “those (the strategies) that have been (or could be) taught, explicitly as part of instruction” (1994:371). While the latter are “always an explicit process in language learning”, the former “may be explicit or implicit, depending on the degree of awareness with which the individual employs them” (1994:371-2).

The role of SI in promoting learner autonomy is widely recognised (Wenden 1991, Little 1994, Cohen 1998) and a consensus is emerging over how best to implement it. The advantages of this approach are twofold: Firstly learners are assisted in becoming more responsible for the actions they take to learn and use the target language. Secondly they are also supported in becoming more effective learners since an awareness of SI allows them to individualise the language learning experience (Cohen, Weaver and Li 1996). Less successful language learners are introduced to the cognitive, metacognitive, social and affective processes identified by their more successful peers in order to help them improve their language study. Chamot (2001) reports that more and less effective learners can be distinguished by the number and range of strategies they use, by the way they apply strategies, and by the appropriateness of their chosen strategies. She found that “[g]ood language learners demonstrated adeptness at matching strategies to the task they were working on, while the less successful language learners seemed to lack the metacognitive knowledge about task requirements needed to select appropriate strategies” (Chamot 2001:32). Therefore the differences between successful and less successful learners do not necessarily stem from the number of strategies they use. They are rather related to the learners’ conscious choices and their flexibility when selecting and applying strategies to a certain learning task. Cohen (1998) goes even further and maintains that the distinction between strategic and non-strategic processes is solely based on the element of consciousness. According to Wenden’s (1991) classification, Chamot’s (2001) statement does, in fact, refer to task and strategic knowledge (see above). I hypothesize that something similar could be said with regard to the learners’ person or self-knowledge taking into account White’s (1999) findings regarding the importance of the learning context. Less successful learners, then, seem to lack the person knowledge or self-awareness needed to select appropriate learning strategies for successful interaction with the learning context. With Hurd *et al.* (2001:343) I acknowledge however, that “[t]hose unaccustomed to reflection in any aspect of their lives, may find it difficult to accept this link between self-awareness, strategic competence and effective learning” particularly in independent and virtual language learning contexts and that they “may well resist it if they are not convinced of the so-called benefits and relevance to themselves as individual learners.” Over 7 years of experience with (online) language learning at DoL

suggest nonetheless that there is a direct link between person or self-knowledge, strategic competence, especially in terms of self-management skills, and effective learning in face-to-face as well as virtual learning contexts such as *Lyceum*.

Cohen (1998) sees instruction in language learning strategies as the most efficient way to heighten learner awareness and to impact on their performance in the second language. He claims that this approach “is considered by a growing number of experts to be the most natural, most functional, in some ways the least intrusive, and potentially the most supportive means of getting the message to learners that how they mobilize their own strategy repertoire will have significant consequences for their language learning and use” (1998:266). SI also promotes a shift of responsibility for learning from tutors to students and thus contributes to an increase in learner autonomy. With Wenden (1991:15) successful learners could therefore be characterised as those who “[...] have learned how to learn. They have acquired the learning strategies, the knowledge about learning, and the attitude that enable them to use these skills and knowledge confidently, flexibly, appropriately and independently of a teacher. Therefore they are autonomous”. This understanding of learner autonomy is shared by Hurd et al. (2001) who have investigated the notion of autonomy in relation to distance language learning. They stress that conscious selection of strategies and self-directed involvement are characteristics of an autonomous approach, and particularly relevant to those learning in independent contexts.

In her study White (1995) explores the relationship between learner autonomy, the instructional context and strategy choice in distance learning. She sees autonomy as something that is internal to the learners and therefore not necessarily linked to any particular mode of study (face-to-face or distance). However, she claims that the demands and opportunities of a distance learning context make it necessary for students to re-evaluate their role and responsibilities as language learners. Their need for self-direction requires them to develop a comparatively higher degree of self-knowledge as a basis for devising their own means of learning and of managing their learning. This is confirmed by Hurd et al. (2001) based on their considerations of the skills and strategies required by those learning at a distance in order to achieve successful outcomes. They maintain that the dilemma of distance language learners is twofold: They have to find out by trial and error which strategies seem to work and to learn the skills of assessing their individual learning needs, including strengths and weaknesses. They therefore have to be self-aware and knowledgeable about their own perceptions, attitudes and abilities. White’s findings also reveal that distance language learners make greater use of metacognitive strategies than classroom learners do, self-management being their most frequently used metacognitive strategy. According to O’Malley’s and Chamot’s (1990:137) taxonomy of language learning strategies self-management involves “understanding the conditions that help one successfully accomplish language tasks and arranging for the presence of those conditions”. The specific situation of distance language learners seems to indicate that a slightly wider notion of self-management might be required, i.e. one that takes the learning context into account. For these learners, then, successful self-management involves understanding the conditions that help one successfully accomplish language tasks in independent and virtual learning contexts and arranging for the presence of those conditions in such contexts.

The project

The main purpose of the project was to help distance language learners to manage themselves and the learning process on the basis of their understanding of how they as individuals learn best. The participants were adult language learners enrolled in OU beginners’ courses for German and Spanish. Their courses were the first OU language courses to offer tuition in a dual strand mode: Face-to-face and online. Their participation in the tutorials was - as is the case for all OU tutorials - optional. A group of 37 students was offered an additional day school in October 2003 prior to the official start of the courses. They were told that the focus of this event would be on the process of language learning and that the main purpose was to help them become ‘better’ (online) learners. All activities were carried out in English in small groups of up to ten learners and designed to foster reflection on the (online) language learning process and one’s role in it. The participants were also sent two tasks which they had to complete prior to their attendance at the day-school. At the end of the project all participants received a questionnaire in order to gain information on how the awareness raising activities and instructed self-management strategies were received and to find out whether learner

reflection on individual approaches to language learning (online) had increased. The tasks were based on Wenden's (1998a) suggested procedures for the development of awareness raising activities for metacognitive knowledge acquisition:

- (1) Elicitation of learners' metacognitive knowledge and beliefs
- (2) Articulation of what has come to awareness
- (3) Confrontation with alternative views
- (4) Reflection on the appropriateness of revising, expanding one's knowledge

The tasks were developed to support students in becoming aware of their self-concept as language learners and in developing a more reflective approach to learning in face-to-face as well as virtual contexts taking into account what Ridley (1997:8) quoted in Hurd (2000:48) says: "We cannot take for granted that learners will have already reflected on their learning, nor can we assume that all learners can articulate their thoughts." The importance of "confronting students' metacognitive knowledge with real facts in order to modify and reconstruct possible misconceptions they may have" has been highlighted by Victori and Lockhart (1995) who described many of the beliefs students hold as naïve and found that they were not supported by research. According to Wenden, tasks and materials based on the procedures outlined above should offer learners the opportunity to acquire new concepts about language learning. Tutors should encourage students "to use these 'new' ideas to seek insights into how they learn" (Wenden 1998a:531).

Main findings

The research reported here has one limitation which should be borne in mind in any interpretation of the results: Since participation in the studies was voluntary and students were told that the focus of the sessions was on the (online) learning process and the role of the (online) language learner, the participants might have been learners who are – by nature - open to reflective approaches and thus demonstrated - from the outset - a comparatively higher level of self-awareness than others would have done.

- (1) 84% of students agreed or strongly agreed that taking part in the sessions has made them more aware of the ways in which they approach language learning.
- (2) 86% of students agreed or strongly agreed that taking part in the activities has encouraged them to take a more flexible approach to language learning.
- (3) 95% of students agreed or strongly agreed that taking part in the activities made them more aware of their preferred sensory channel (visual, auditory, kinaesthetic).
- (4) 92% of students agreed or strongly agreed that the concept of different sensory preferences is relevant to (online) language learning.
- (5) 86% of students agreed or strongly agreed that they felt encouraged to reconsider their perceived weaknesses with regard to language learning. Thus one participant commented:
"I now perceive myself as being more able to attain a positive outcome. It will appear less of a 'chore' by giving it this positive approach."
- (6) 89% of participants found the tasks aimed at encouraging them to reframe their perceived weaknesses useful or very useful.
- (7) The tasks designed to increase the learners' awareness in terms of their resources and skills scored equally highly (88%).
- (8) 95% of students agreed or strongly agreed that taking part in the sessions encouraged them to focus on their skills.
- (9) 78% of students agreed or strongly agreed that they felt encouraged to transfer skills from other areas of life to language learning, or, as one participant put it:
"Many of the skills I have are transferable- focusing on my strengths enables me to achieve my goal. Open-minded, enjoy learning new things, organised, enjoy structure / processes, motivated, adaptable, resourceful."

- (10) 89% of students agreed or strongly agreed that taking part in the sessions has improved their self-awareness.
- (11) 94% of students agreed or strongly agreed that being self-aware and reflective are important characteristics for language learners.
- (12) 97% of students agreed or strongly agreed that being able to assess one's own weaknesses and strengths is important for language learners.

Preliminary conclusions

The results of the study suggest that activities designed to foster metacognitive knowledge acquisition and instructed self-management strategies can be applied in CVLEs to enhance the cognitive capacities underlying effective self-management such as detachment and critical reflection (Little 1991) and thus lead to metacognitive growth. It would seem that this approach can support language learners in developing awareness of how to manage themselves and their learning more efficiently. The findings also confirm White's (1999:444) observation that "[a]ttention to [learner] expectations and beliefs can contribute to our understanding of the realities of the early stages of self-instruction in language." Self-instruction in language learning refers to situations in which learners are working on their own, without the general control of a teacher or tutor, as, for example, in distance language learning settings where the use of CVLEs such as *Lyceum* is becoming increasingly popular (Hauck and Hampel in press). Moreover the results seem to confirm that learners need "regular opportunities through their learning to develop metacognitive awareness" (Hurd 2000:49) as well as "guidance in improving and expanding their knowledge about learning so that they may [...] become more autonomous in their approach to the learning of their new language" (Wenden 1998a:531). Considering that "probably no other field of study implicates self-concept and self-expression to the degree that language study does" (Horwitz, Horwitz and Cope 1991:31) learners may more specifically need guidance in improving and expanding their knowledge about themselves and their role in the language learning process in order to achieve a higher degree of autonomy. The activities used in this project could therefore be particularly beneficial to those learners who are perceived as being less successful in second language acquisition as they are aimed at raising their self-knowledge and thus potentially also their efficiency in using appropriate language-learning and language-use strategies. By becoming aware of and re-considering their individual *learner* strategies they are supported in the improvement of their *learning* strategies so that they do not have to find out any longer by trial and error which strategies - at least in terms of self-management - seem to work for them. As Little (1994:86) suggests: "It is essential to the development of autonomy that learners become aware of themselves as learners - aware, for example, of the learning techniques they instinctively favour and capable of judging how effective those techniques are."

The findings of this study indicate that tutor interventions based on the suggested approach to task design could support changes in learners' metacognitive (person and strategic) knowledge and lead to the learners' more active involvement in the regulation of their learning. Whether the increase in person and strategic knowledge through a higher level of self-awareness will automatically result in greater choice and flexibility when selecting and applying strategies to specific tasks, i.e. lead to an increase in task knowledge requires further rigorous investigations.

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Author:

Mirjam Hauck
The Open University/Department of Languages
Walton Hall
Milton Keynes
MK7 6AA
United Kingdom
m.hauck@open.ac.uk

EMERGING PRACTICES FOR SUPPORTING THE LEARNER IN DISTANCE EDUCATION AND E-LEARNING; REAL WORLD CASES AND THE CONCEPTUALISATION OF PRACTICE

Per R. Stokke, Norwegian University of Science and Technology

Abstract

This paper attempts to bridge the diverging views on distance education and e-learning as a dichotomy of autonomy vs. heteronomy". It emphasizes instead the need both for the supply side i.e. "the sage on the stage", as well as the demand side approach, "the guide on the side", in supporting the learner in distance education and e-learning. It also outlines the basic importance of technology in creating entirely new strategic opportunities for supporting the learner in fundamentally new ways. By organizing distance education and e-learning as "virtual enterprises" using the World Wide Web for global sourcing, manufacturing, marketing, distributing and sale, high quality knowledge products could be custom made and tailored especially for the individual learner and provide extreme flexibility and unlimited choice independent of time and space. The paper presents case studies based on four years of experience using a host of new methods for supporting the learner in distance education and e-learning. These cases demonstrate how advanced new information and communication technologies could challenge the way most traditional distance education and e-learning courses are organized. The paper also outlines a generic concept for supporting the e-learner by organizing distance education and e-learning as global virtual enterprises based on information as their basic resource and refined and manufactured knowledge products as their final value proposition.

1. Introduction

Fred Lockwood [1], in his foreword to Otto Peters' book [2] "Distance Education in Transition", states: "...and we do not need a detailed understanding of computers, software and networks – in fact we only need to be aware that this technology exists", and he rallies the old slogans of "autonomy vs. heteronomy" and "from the sage on the stage to the guide on the side".

As one of the now legendary 68ers I thought we had long past outlived this useless and rather confrontational paradigm of polarization!

Peter Cochrane [3, 4], previous head of the Research Department at British Telecom Laboratories, and author of the famous book "Tips for time Travelers", stressed in his keynote on Communications Technology at the 2003 World Technology Summit in San Francisco this June, that even well known, off the shelf technologies, were not being used today to its full extent.

Strategy used to drive technology. Today technology actually drives strategy by enabling totally new approaches to old and new business problems. This development demands new strategic technologies for education as virtual enterprises [5] beyond our traditional perspectives. No longer can we view technology as a constant [6]. It's an exponential variable in the equation of Distance Education and e-Learning. In this development, the dichotomy of autonomy vs. heteronomy is irrelevant and the question of knowledge supply is equally important to that of knowledge demand, and vice versa.

There has been a lot written about ubiquitous technology and pervasive computing, but little about how it will change education and the dissemination of knowledge. Tomorrow, the traditional concepts of learning and education will be obsolete. Digital information, sourced in a global market, will serve as the raw material for the manufacturing of a wide variety of digitized knowledge products to be distributed and sold in a global ubiquitous knowledge market independent of time and space. Open learning and distance education will increasingly be organized as virtual and ubiquitous enterprises competing for the best resources globally and developing, marketing, selling and distributing a host of

advanced, high quality digital knowledge products tailored for different markets anywhere and anywhen.

In this paper we will look at the first visible changes and try to establish what the possible consequences could be for the learner in distance education and e-learning.

2. Case Stories

The Norwegian University of Science and Technology (NTNU) have, since 1999, experimented with new methods for supporting the learner in distance education and e-learning in a course entitled “Digital Communication and Organizational Challenges”. The aim has been to develop a course that could serve as an example of its own theme, i.e. a course that illustrated in practice how modern information and communication technologies (ICT) could challenge accepted organizational theory in general and the way most traditional university courses are organized in particular.

Modest precursors of virtual learning enterprises are presently emerging in different forms based on different information and knowledge sources, using advanced off the shelf information processing, and producing a range of knowledge products aimed at different markets world wide.

The real life cases outlined here are based on examples from four years of advanced teaching of high tech web based courses at NTNU and the Norwegian School of Management (BI). These courses use most available information and communication technologies including online multimedia demos, web based streaming video, live web casts, and video conferences. The courses are normally based on the traditional open class room model with an optional distance learning approach. They are built entirely around a virtual value chain sourcing absolutely all their knowledge content in a global knowledge network.

The bulk of the courses consist of up to twenty guest lectures by teachers, researchers, consultants and industry executives around the world. The knowledge products made available by these resource persons make up the core value of the courses and represents its intellectual capital. Traditionally, guest lecturers would have to be physically present in the class room. However, the new information and communications technologies were utilized to make all guest lecturers available real time, via video conference exclusively for the students in the class room, or via web cast for a global audience with the proper access to the course web. In addition, recordings of all lectures were made available on the course web as streaming video synchronized with slides and accompanying multimedia demos for later perusal at the students’ leisure.

Supplementing this main core of digital knowledge products were the traditional reading assignments, all of whom were made available or accessible as digital full text documents or books via the course web. Many science journals now offer online copies of their articles for teaching purposes, and while online bookstores make it possible to purchase most traditional books online, many are now offering an increasing number of e-books for purchase and download online. Most university libraries offer online access to a large number of digital full text documents and books.

The traditional reading assignments normally constitute the bulk of the knowledge transfer in a traditional course-based learning experience. However, the new multimedia technologies makes it possible to substitute much of the traditional written text with rich and powerful multimedia demos offered online as streaming video. These courses use online multimedia demos from a global network of suppliers as a test for this new concept. Multimedia demos can be short recordings edited and cast especially for teaching, communication and demonstration purposes, or they can be ad hoc recordings illustrating real life processes and occurrences, much like TV reports and features.

All in all, these courses illustrate the concept of virtual learning enterprises. Operating almost exclusively in “marketspace”, and built around a “virtual value chain” characteristic of the knowledge economy, they use ad hoc or permanent knowledge networks for their incoming and outgoing logistics. Based on initially unstructured information and unrefined knowledge components as their basic resource and raw material, they can easily be viewed as the first modest precursors of virtual learning enterprises.

These budding virtual “learning enterprises” are mostly based on a personal professional network, taking advantage of generous “pro bono” knowledge input. However, we can see the contours of an evolving knowledge market where unstructured information and unrefined knowledge components will be available in digital form on open or proprietary networks at market prices following normal market mechanisms.

3. A Generic Concept

Working with real life cases, based on examples from four years of advanced university teaching, lead to the realization that these examples constituted modest precursors of what might be called “virtual learning enterprises”. In developing these precursors the generic concept of virtual enterprises evolved gradually. This concept is founded on unstructured information and unrefined knowledge components as the basic new resource and raw material of the knowledge economy, and on market space and the virtual value chain as the back bone of the virtual enterprise.

This generic concept involves, of course, a knowledge market where unstructured information and unrefined knowledge components of varying amount and quality are made available in digital form on open or proprietary networks, subject to fluctuating prices depending on demand and supply and other normal market mechanisms.

The generic concept also entails the concept of a knowledge bank, a repository for knowledge as intellectual capital, the equivalent to the physical capital of the industrial economy. The knowledge bank is network based with a web interface for deposit and withdrawal of intellectual capital in digital form.

We have built several prototypes of such knowledge banks for different purposes. One such prototype is meant to reside on Internet with a global presence on the web. This type of knowledge bank would typically focus on a number of different knowledge markets, and would be open for deposits and withdrawals by the general public world wide. Interest on deposits could be based on the concept of “employed capital” i.e. depending on the number of withdrawals of a specific item of intellectual capital. Withdrawal of intellectual capital could mean viewing, linking, citing, leasing, downloading or outright purchase of copies or exclusive rights.

Another prototype, now being prepared for installation on a university network, in a major international oil company, and in a global consulting firm, resides on proprietary networks to be accessed through the respective intranets. These types of knowledge banks are meant to represent the organization’s intellectual capital and would be open only to employees or persons with special authorization to access the respective intranets. Institutional- or enterprise knowledge banks of this type would make rich digital knowledge representations available to any or all of the authorized and relevant knowledge workers on a need to know basis at any time and any place.

Such knowledge banks could also be used to measure each employee’s contribution to the enterprise’s intellectual capital. By registering the type and amount of deposit each employee makes to the respective organization’s knowledge bank and by correlating this with the frequency and amount at which this capital is withdrawn or purchased internally and externally if possible one could compile a score card or, if so desired, a ranking of each employee’s productivity. This would focus on knowledge as the main product and intellectual capital as the index of competitiveness for any organization in a knowledge economy.

4. Consequences

The consequences of this concept would be numerous and far reaching. We would experience what amounts to a revolution in the traditional teaching/learning “industry” resulting in an entirely new “industrial” paradigm both in terms of to the learner’s roles, expectations, options, and need for support.

A profound consequence of this new, and still evolving, industrial paradigm is the information based creation of value by the manufacturing of a host of diverse knowledge products adapted to a wide range

of different markets. The virtual value chain of the knowledge economy generally have a sequence of five separate activities: gathering, organizing, selecting, synthesizing, and distributing information. Just as someone takes raw material and refines it into something useful, so a manager or a teacher today collects raw information and adds value through these five steps. In this new paradigm the concept of “marketspace” replaces the traditional “marketplace”. Similarly, a teacher today, and increasingly in the future, is able to access global information networks and “gather, organize, select, synthesize, and distribute” raw information and unrefined, unstructured knowledge products, and add value in the process by manufacturing advanced digital, live or recorded, knowledge products of extremely high quality for sale or for private consumption.

Industrial competitiveness is closely related to knowledge, understanding, and insight into any organization’s core competence, its major value creating activities, and its relationship to the surroundings; in short, its intellectual capital. In a 1988 Harvard Business Review article by Arie DeGeus, entitled “Planning as Learning” [7], he stated: “The ability to learn faster than your competitors may be the only sustainable competitive advantage”. The actual function of intellectual capital in creating value at all levels of an organization, (be it a business, a corporation, an industry, or even for a national, regional or global economy), is to contribute to competitiveness. Competitiveness is therefore basically and largely a function of intellectual capital, i.e. knowledge, skill, experience and know how. Industrial competitiveness is a function of overall intellectual capital which in turn depends on the ability to learn faster and more efficiently than one’s competitors.

Many corporations have restructured during the last decade to increasing the efficiency of their value chains, and to improve their ability to learn fast and thus increase their intellectual capital. Such restructuring was enabled by external and internal information networks. Some use the World Wide Web, others use networks exclusively reserved for their industrial cluster, and others again have their own internal knowledge networks (intranets) or even knowledge banks/ repositories where their entire intellectual capital is captured and stored digitally and made available globally to support and guide employees in any company operation. In many ways these knowledge-banks/-repositories are exclusive open learning facilities for corporate distance education.

The educational consequences of the new industrial paradigm are staggering. We see an endless potential for digitally represented knowledge products. Both traditional universities, open learning and distance education, and corporate knowledge banks, operating as virtual learning enterprises, will increasingly use global sourcing and distribution through public (Internet) as well as proprietary (intranets) knowledge networks as elements of a virtual value chain for the manufacturing of digital knowledge products.

Universities and other dedicated public and private learning organizations have yet only partially grasped the full extent and the revolutionary implications and consequences of the knowledge economy for their traditional value chains. Such institutions are only gradually adapting the new industrial paradigm and hesitatingly re-structuring their traditional “person centric” and “time- and physical presence dependent” value chains. As the world adapts even further to the new industrial paradigm, and as its underlying technologies continue to develop in scope and sophistication, we expect new markets to emerge and traditional universities as well as open learning and distance education to evolve into virtual learning enterprises of global scope and reach.

Forthcoming consequences would represent a radical change in that traditional educational institutions morphs into learning enterprises using advanced information and communication technologies to structure and organize their “learning value chains” in the form of “virtual value chains” starting and ending in a digital global market for information and knowledge.

The learners role in this new knowledge paradigm would change completely. S/he would have total and instantaneous access, independent of time and space, to a global market of advanced knowledge products, including personal access to both “sages” (on the stage) and “guides” (on the side) depending on their own judgment of need and preference. The old, useless, and rather confrontational paradigm of polarization of the teacher’s role vis-à-vis the learner would cease to be a valid concern. This dichotomy, that seems to linger as a ghost from the past in many distance learning environments,

will lose its relevancy in a wired world much like the old political polarization and confrontation between capitalism and communism today becomes increasingly obsolete when new technology and insight helps realize old Marxist social goals as a consequence of free individual access too, and private ownership of, information and knowledge as the basic “means of production” in the emerging knowledge economy.

Likewise, the whole concept of “support” for the learner would undergo a radical transformation involving a complete redefinition of this concept. The lingering focus and concern in many traditional educational environments on “who could or should be the persons or institutions to provide support” would cease to be important. The new knowledge paradigm would be built around ubiquitous technologies where learning support and other related knowledge products would be manufactured on a customized just in time basis and would market and sell itself in an instant response to individual needs both by human and non-human learners (or customers).

5. Conclusions and Perspectives

In the new industrial paradigm organizing for supporting the e-learner in distance education and e-learning might take on the characteristics of virtual learning enterprises operating almost exclusively in a web based “marketspace”. Virtual learning enterprises could be built around the virtual value chain of the knowledge economy and would use ad hoc or permanent knowledge networks for their incoming and outgoing logistics. They could be based on unstructured information and unrefined knowledge components [8] as their basic resource and raw material. Virtual learning enterprises would use a host of increasingly advanced information and communication technologies for large scale gathering (i.e. sourcing) of this raw material in a global virtual knowledge network (i.e. Internet) and for the production and manufacturing of a diverse number of advanced digital knowledge products. These products would be marketed and sold in a number of different knowledge markets locally and/or world wide. They could then organize, select, and synthesize, (in short manufacture, market, sell and distribute), a plethora of digital knowledge products of high quality tailored for specialized knowledge markets. This model is not only applicable for traditional university teaching, open learning and different forms of distance education. It is just as important and relevant for business and industry as well as for any form of value creation in the new networked knowledge economy.

Traditionally, knowledge could only be sourced, manufactured and distributed by the physical presence of teachers, books, illustrations and other teaching material with a material presence, all of which had to be physically transported to the student or vice versa. Information and communication technology has gradually changed this industrial style value chain, first by the introduction of telegraph, telephone, radio, telex and fax, and later by tape recorders for voice and finally for full fledged television and eventually video recordings. Initially, this development had only marginal influence on the traditional teaching/learning value chain. However, with the emergence of the computer came Internet, and with the PC the World Wide Web, and finally the knowledge community started to notice the significance of a non material, digital representation and presentation of knowledge, although only hesitatingly and on a very limited scale.

Suddenly it was possible for anyone to communicate instantly world wide at reasonable cost, using the written word, illustrations and animations, video recordings streaming over Internet, and real time video via phone lines or wireless, using Internet based protocols. Today it is even possible to broadcast live over Internet (Web Cast) directly from any Internet connected location, in the world, and even broadcast live directly from anyone’s private wireless connected video camera. Suddenly, access to a global “marketspace” via a virtual value chain is available to anyone at affordable cost. Suddenly, anyone can access, harvest or purchase nearly unlimited raw information and unstructured knowledge products, restructure and manufacture their own knowledge products aimed at the market segments of their choice, and distribute and sell these products globally in marketspace.

While open learning and distance education are the most progressive learning institutions today in this new virtual value chain, we feel that they, with their present use of information technologies, have barely scratched the surface. Today it is entirely possible to reach any information and any

professional, expert, and teacher, and to structure and represent their knowledge digitally in a number of formats that lends itself excellently to supporting the learner in open learning and distance education as anything from documents, pictures, sounds, animation, video-recordings, live video-conferences, and streaming video and web casts via Internet or any other open or proprietary networks.

A new market for the basic resource of the knowledge economy is developing and new business opportunities are abound. We will see the development of new business models based on the sourcing manufacturing and distribution of digital knowledge and a host of new businesses, corporations and enterprises driven entirely by information and knowledge, and providing tools of ever increasing quality and sophistication in distance education and e-learning.

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Author

Per Rudolf Stokke
Norwegian University of Science and Technology
Trondheim, Norway
<http://www.apertura.ntnu.no/prs/>
prstokke@online.no

ONLINE SUPPORT IN THE ONLINE ECONOMIC EDUCATION PROJECT

*Heiko Feeken, Axel Kleinschmidt & Olaf Zawacki-Richter,
Carl von Ossietzky University of Oldenburg*

1. Abstract

The "Economic Education Online" (EEO) project is developing and testing an internet-based teacher training programme for teachers of economic education. Furthermore, preparations are being made for exporting the programme to Poland and Russia.

Active learner support during on-site events and in the online learning phase is an essential element in the concept of "Economic Education Online". The following paper describes the learning support measures for learners. Special emphasis is placed on tutorial online learner support. Tutor's responsibilities, functions and qualifications are based on the requirements of the relevant target groups. Therefore, the training of online tutors gains added importance.

2. The "Economic Education Online" programme

In order to close the current gap in teacher development, as well as basic teacher training in Germany in the area of economic education, an internet-based learning system was developed called "Economic Education Online" (EEO).

EEO is financed by a public and private partnership model. Project partners are the Bertelsmann Foundation (Project Management), EWE AG Oldenburg, the Heinz Nixdorf Foundation, the Ludwig-Erhard Foundation, the Foundation of German Business, the Baden-Württemberg Ministry of Culture, Youth and Sport and the Lower Saxony Ministry of Science and Culture. The pilot phase of the project ends in December 2004. Sustainability is an important aim of the project, in order to be able to continue to offer an internet-based qualification after the initial funding period.

10 German states are involved in the programme: Baden-Württemberg, Brandenburg, Bremen, Hamburg, Hesse, Mecklenburg Western Pomerania, Lower Saxony, Northrhine-Westphalia, Rhineland Palatinate and Thuringia.

Project leader is professor Kaminski from the Institute for Economic Education at the University of Oldenburg which is responsible for carrying out the project and academic project management. The Institute for Economic Education co-operates closely with the the Center for Distance Education.

More current detailed information can be found on the project's Internet site (www.oebo.de) or on the Institute for Economic Education homepage (www.ioeb.de).

3. Pedagogical approach

3.1 Content

As part of the project 74 modules are developed through a network of more than 40 academic institutions in Germany, Austria and Switzerland. 30 modules are currently available in the online learning environment and until end of 2003 about 300 learners coming from 10 federal regions are registered in the programme. To support the learners, 37 trained tutors are involved.

Study materials are developed following the instructional design process (cf. Schreiber 1998). The content of "Economic Education Online" is divided into economic, business and pedagogical components. Modules for job orientation and scientific propaedeutics are also offered. In total, seven basic modules are developed, as well as more in-depth modules concerning "Private Households" (five modules), "Companies" (14 modules), "State" (12 modules), "International Economic Relations" (six modules), Law and Economy (six modules), four modules on scientific propaedeutics and 20 pedagogical modules.

Examples of economic-political issues serve as basic situations for linking and observing the module contents from different perspectives (Example: pop music and the economy; the debate about copyright laws serves as an example for the topic of the function of the state in a capitalist society, within international business relations or private households).

Teaching and learning

The course is divided into online learning and on-site phases (cf. blended learning, Sauter & Sauter 2002). In Lower Saxony, for example, 15 days of on-site tuition are scheduled over 2 years, focussing mainly on pedagogical elements of economic education.

The pedagogical concept is based on a constructivist understanding of learning and teaching (cf. Duffy & Jonassen 1992, Gerstenmaier & Mandl 1995, Jonassen et al. 1995). It is important to keep a balance between instruction (structure) and constructivist elements (dialogue). Alongside predefined exercises or self-assessment, the students also have to construct learning maps for certain areas of content.

Learning activities online are as follows:

- Using the multimedia module contents provided and working with interactive objects.
- Identifying central issues of individual content fields, using examples from current economic-political circumstances.
- Writing excerpts (for example concerning contents of the in-depth modules) exchanging with other members of the learning group.
- Debating module contents in discussions and answering questions.
- Carrying out self-assessments.
- Designing and discussing lesson plans and proposals (partly as a group exercise).

The on-site sessions focus on the following activities:

- Presenting and discussing participants' contributions.
- Academic and pedagogical work in relation to the delivery (teaching economic education; planning lessons).

All these activities require tutorial support, which is conceptualised as follows.

3.3. Tutorial Support

Online learning affords more flexibility and independence, but also transfers more responsibility to the learner (Moore & Kearsley 1996). Support, guidance and advice is therefore of critical importance for successful online learning (Simpson 2002, Zawacki-Richter 2004). Depending on how the new information and communication technologies are applied for teaching and learning, two different ways of their integration can be identified:

- Computer-based communication is used in an additive way, i.e. as with first and second generation distance learning (cf. Garrison 1985), many resources are invested in the production and distribution of high-quality study materials, which are then "only" accompanied by a tutor. Therefore, computer conferencing is simply another channel for

support and does not change much in terms of the tutor's responsibilities. Communication becomes quicker and more flexible. This model is referred to as "cmc added-on" (Thorpe 2001).

- The teaching/learning process and interaction is more defined by the tutor, and less by the study material. This approach is referred to as the "interactive model" (Allen 2001). Much greater responsibility is transferred to the tutor here: "[...] the tutors of the course carry authority to create the detailed course teaching as it progresses over the duration of the course, rather in the way a conventional university lecturer might decide how they were to teach [...]. Such instructors must of course be content experts, but they will also need even more skills of learning facilitation than the conventional tutor of a second generation distance education course" (Thorpe 2001, p. 17).

"Economic Education Online" carries out an intermediary role. The course modules are written in advance by experts and are then designed for the online learning environment, so that they can be used as self-learning materials. For the tutors there is still leeway regarding their support of the course. They are not only available for questions in conferences, but they also organise the group work and set tasks for self-assessments and tests. The functions and roles of the tutors can be divided into four categories: pedagogical, organisational, social and technical (cf.. Berge 1995).

Category	Tutor's responsibilities
pedagogical	<ul style="list-style-type: none"> • Learning advice for the participants as far as the content is concerned • Advice and support for the participants regarding application of the content (teaching scenarios, utilisation of special services such as online databases etc.) • Adjustment and expansion of tasks depending on the interests and progress of learners
Social	<ul style="list-style-type: none"> • Feedback on participant's contributions, as well as on self tests • Creation of a positive learning atmosphere • Situative reaction to events (e.g. conflicts) during the course • Motivation in the case of low participation
Organisational	<ul style="list-style-type: none"> • Set-up and support of working teams (virtual and/or physical) • Observation and monitoring the formal and academic standards of written work
Technical	<ul style="list-style-type: none"> • Support for questions regarding the use of the learning platform (in order to resolve specific technical problems additional support is provided)

The online phase follows an initial on-site phase, which is important from a social and psychological point of view to get to know to the participants, tutors, the overall concept and the technical learning environment. Group feeling and identity must be carried over from the on-site phase into the online phase, meaning social and organisational matters are given priority at the start. This phase is of great importance for the seamless success of online measures, since for the participants the content, media and type of communication are all new. Such situations could give rise to worries which could hamper the learning process and active participation within the learning environment. Therefore they, need special attention. It may also be the case that many technical questions have to be resolved at the beginning of the course. Moving on from this, the emphasis of the tutor's work shifts to pedagogical elements.

In the testing area of the learning environment, which is only accessible for the tutors, there are questions and tasks for each of the 40-50 sub-headings of each module. The tutors select a number of exercises from this pool and make them available for the students. Discussions are initiated and moderated based on these activities. The tutors can influence to a large extent which topics are then dealt with in depth. They gain an overview of learner's progress and commitment from the test results and learner's contributions in the conferences.

Following the initial phase, a content field is then developed further in each case. This includes selected modules of a given focus area. The topics approached using an authentic example scenario e.g. “company formation” in the “company” content field. The tutors designate work groups in which, for example, individual in-depth modules are explored and are then presented as excerpts to other course participants in the virtual classroom.

Additionally, the tutors are responsible for supporting the learners in resolving constructive tasks. Thus learners put together lesson plans and concepts etc. with regard to the individual subject matter.

5. Training the Online Tutors

Given the complex functions and roles of a tutor in Economic Education Online, it is clear that a special training programme for online tutors is needed to enable them to carry out these responsibilities.

The training for the online tutors is broken down into a one week on-site session and a three week online phase. It is provided by employees from the Institute of Economic Education and the Center for Distance Education. The tutors are teachers from the federal regions involved, who receive time in lieu for training and their activities as tutors. The training has been offered two times since June 2002 with 37 participants.

5.1 On-site phase

During an on-site week at the University of Oldenburg, the aims, contents and organisation of the programme Economic Education Online will be introduced to the future tutors. At the on-site event the first personal contacts can be made, which have a positive effect on motivation and will facilitate communication between the forthcoming online tutors. The employees of the Institute for Economic Education convey the pedagogical and academic concept of the education and training. The employees of the Distance Learning Centre are responsible for technical training and special aspects of learning and teaching online as well. Technical skills in using the internet-based learning management system is a prerequisite for tutorial work. Technical details are therefore the subject of several sessions during the on-site week..

After presenting the individual elements of the online learning environment, the functions and use of different tools are worked out with exercises from the participant's and the tutor's point of view.

The on-site week ends with a reflection of the training and an introduction to the online phase.

5.2 Online phase

The online tutorials are based on authentic situations and are practice oriented. As a result, the one-week on-site event is followed by a three-week online phase, which is intended to enable the participants to develop a routine in coping with the internet-based learning environment. Once the on-site event has taken place, the technical basics are in place for dealing with the software. During the following weekend the participants install the software on their computer at home in order to be able to begin the online phase in the following week.

Participants are expected to invest seven hours per week in the course: one hour per day in order to ensure that they participate in the discussions and group work on a regular basis.

The objective of the online phase is not so much to provide technical knowledge but rather to learn the role and tasks of an online tutor in the framework of Economic Education Online . The technical routine results from participating in the online course (participant's view). In addition, a copy of one course module is provided so that the participants themselves are able to experiment with a module from the tutor's point of view.

During the first week (Introduction) the relationship between online learning and distance learning is explored. This relationship is, unfortunately, often overlooked. Indeed, the development of online

courses should benefit from support systems which have been developed at distance teaching. Articles are made available, which deal with special needs of distance learners. Another topic covered during the first week includes the pedagogical opportunities of computer-supported collaborative learning (CSCL). However, considering the fact that only seven hours learning per week is designated, there is not a lot of time to read long, academic papers. Therefore, the materials used in the Media Center have been prepared didactically. A page precedes every document, which explains why the text choice has been made and the participants are focused on the main topics in the form of asking questions as a means of understanding the text (study questions). The documents are provided in their original format or as excerpts. The discussions in conferences are the essential element of the course. Each week ends with a summary by the course leaders.

In the second week (Models of Online Tutoring) participants explore different models of tutoring that impose different requirements on tutorial work. The learners apply these models on Economic Education Online and reflect them in terms of pedagogical, organisational, social and technical roles and functions in online tutoring. This week also offers a practical insight into the daily work of online tutors. An overview of the various responsibilities is provided e.g. by Berge (1995), Mündemann (2002), Müskens (2001), and Salmon (2000).

During the third week the future tutors work in groups. It is a challenge to experience for oneself the difficulties that can arise in "virtual" co-operation. Taking into account the overall concept of "Economic Education Online" and using all available materials, each group is to put together a concept for tutorial support. In order to start with the group work, a group speaker is nominated to coordinate the group process, delegate smaller tasks and ensure that they are completed on time. At the end, the results are gathered in a collaborative document which is then presented in the public conference in order to obtain feedback from other groups and from course leaders. The course ends with a summary and a closing feedback conference.

6. Further perspectives

The concept as described here is very ambitious. A great deal is expected of the tutors, not only in terms of subject matter, but above all in relation to pedagogical and social skills. Meeting these expectations is by no means guaranteed, despite careful employee selection, despite the measures outlined above and despite the fact that the tutors will also benefit from the project in terms of their daily work. Nevertheless, the project managers are convinced that the tutors will be able to meet the expectations placed upon them.

The demands made on tutors concerning their work with participants are the same as those that people responsible for the project place on themselves regarding the support of the tutors, not only in terms of preparatory seminars, but also in the form of ongoing support. The key term is empathy, and here again it is worth remembering the words Börje Holmberg: "On the basis of my many years of experience I dare claim that the most favourable factor paving the way for motivated students' success and preventing dropout is empathy between the learning and teaching parties, availability of immediate support and advice when difficulties crop up, ease in consulting tutors and other subject specialists and general feelings of rapport." (Holmberg 2001, p. 74)

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Authors

Heiko Feeken

Carl von Ossietzky University of Oldenburg, Institute for Economic Education
D-26111 Oldenburg
Germany
heiko.feeken@uni-oldenburg.de

Axel Kleinschmidt

Carl von Ossietzky University of Oldenburg, Center for Distance Education
D-26111 Oldenburg
Germany
axel.kleinschmidt@uni-oldenburg.de

Dr. Olaf Zawacki-Richter, MDE Faculty (Oldenburg University)
and Bankacademy e.V., efiport AG, Frankfurt/Main
Germany
zawacki@bankakademie.de

STRATEGIES OF PEER-TO-PEER SUPPORT IN ONLINE COLLABORATIVE LEARNING

Maria Lucia Giovannini & Michela Morelli, University of Bologna

Introduction

According to the White Paper of the European Commission (1994) collaborative learning, the use of NTIC, working and learning in groups together with the ability to re-use one's own knowledge should be enhanced in academic learning. McAlpine (2000) registered among graduate students a general lack of analytical, communicative and interpersonal competences. Nunan (2000) claimed the necessity to augment a better control of student learning together with a promotion of critical thinking, critical debates and interactions among peers, students/teachers and students/knowledge.

Interactive and communicative abilities requested to students appear to be particularly decisive in teacher profession; collaboration, interdisciplinary together with the willingness to interaction and critical debate should be some of the most essential characteristics of a competent teacher. Recent research in Italy demonstrates how teachers lack of interdisciplinary and collaboration with their colleagues (*Piano Nazionale di Formazione degli Insegnanti sulle Tecnologie dell'Informazione e della Comunicazione*, Ministry of Education, May 2002). Discussion and critical debates should be promoted in teacher training. Future teachers should be helped in revising their own implicit theories participating in more interactive environments.

The increasing widespread use of new technologies, such as computers and Internet, the use of CMC systems, like electronic conferencing and on-line discussion environments seem to be a right answer. Computer mediated communication systems, forms of asynchronous on-line discussion can provide an effective way to foster class discussion and peer-to-peer interactions and have an enormous impact on student thought. In teacher education CMC systems have huge potentials to facilitate teachers' learning and professional development. Recent research supports that CMC promotes collaboration, development of reflective skills and interaction among peers (Mason, 1998). On-line interactive environments, such as electronic conferencing, are ideal tools for collaborative and co-operative learning, in particular as a support for traditional learning, combining in-class lectures and on-line learning environments.

As a result, teacher profession should be enriched by new competences concerning new technologies and it should gravitate on three different areas: competences on a specific disciplinary field, pedagogical and didactical practices and theories, and mastery of new technologies. Actually, the first condition to transmit such competences to future teachers is to create an adequate environment in which they can make use of NTIC personally. The aim of this study is to examine a particular online environment arranged on purpose for preservice teachers.

Theoretical Framework

Based on socio-constructive principles, preservice students have to be stimulated to collaborate and interact. In collaborative learning "students are required to work together in the learning process, and to reach a consensus through negotiation to accomplish group tasks" McAlpine (2000). In collaborative learning situations, students actively search for information, ask questions, engage in critical discussion, discuss answers, make proposals and reply to other proposals. Prior knowledge, experience and personal beliefs and values contribute to the co-construction of knowledge. Collaboration with other students stimulates motivation, provokes activity and makes learning more realistic. Students can ask questions to each other and discuss problems from different perspectives. They can propose various answers and solutions and evaluate them on different criteria (Petraglia, 1997).

Internet and network-based computer programs offer new opportunities for collaboration, communication and learning. Collaboration can take place at a distance, by the use of asynchronous and

synchronous CMC systems. Asynchronicity changes the dynamics of relationships: participants have more time to reflect on and produce contributions, to think about course content and to address a diverse set of topics in more depth that can be done in class. As a consequence, asynchronous tools allow students to contribute to each other's understanding and to conceptualise a topic from multiple viewpoints so that learners can actively construct their own learning. They engage themselves and others in reflective explorations of ideas, draw conclusions based on their explorations and synthesise those conclusions with previous knowledge.

Instead of deductive, analytic teacher-based exercises and lectures, asynchronicity promotes a more inductive, problem solving learning; instructors may provide their students open-ended questions and problems that require discussion and collaborative work to answer. Computer-mediated technology also provides tools that are useful in promoting collaborative learning activities that can "mediate communication between learners" (Palloff, 1999). As opposed to traditional lectures in which the instructor is at the centre of all activities and guides the interaction CMC environments support a learner-centred learning.

Bannon points out that such computer-mediated collaboration "allows for the cross-fertilisation of ideas, [and] for the fostering of multidisciplinary perspectives on related problems" (Bannon, 1995). In a review of numerous studies on collaborative learning, Johnson and Johnson (1992) concluded that collaborative tasks lead to greater student satisfaction with learning processes and outcomes. In a process of collaboration in which students work together in order to construct new knowledge peer to peer support gains a central role. Peer to peer interaction may be highly facilitated by the increased use of interactive communications technologies, such as discussion forums and online conferencing. Here, *student support* has to be viewed as the whole facilities and interventions used by students in order to fulfil the course goals, to cope with organisational problems and to overcome communication problems (Tobin, 1995). Research shows that techniques and tools which enable students to cope with logistic problems, may also be used to promote interpersonal relationships in online contexts (Tait, 2000). From these sources it appears possible to examine whether and to what degree students give support their peers in an online interactive environment.

Background

In order to create an environment for student interaction and discussion with both peers and instructor, a discussion forum was developed for course for preservice teachers attending the first year and enrolled in an evaluation course in initial teacher education. The course took place at University of Bologna-Italy within the *SSIS* (School of Teacher Training for Secondary Schools) from the end of April to the end of May 2003 in the academic year 2002-03. The curriculum included three different subjects: Evaluation, Experimental Pedagogy and Education Technologies. Students belonged to three different subject areas (music, science and gymnastics).

Tools for interaction carry different labels: CMC tools, groupware, tele-conferencing systems, electronic conferencing systems, asynchronous learning networks (ALN), virtual learning spaces, virtual classrooms, and forum systems Here, the term forum system will be used to refer to a text-based asynchronous (i.e., non simultaneous) electronic environment for interaction.

As an environment for online discussion and debate *Yahoogroups* was employed in the course. The choice of this forum system is mainly pedagogical; unlike many discussion forum services which promote mere discussion, the system allows students to upload and download course materials, to share resources in a discussion area with all threaded messages, and to use a particular section for links and surveys. The use of this discussion forum is based on the socio-constructive principle, which considers knowledge, as the result of a process the learner is responsible for. "Knowledge is the result of particular forms of collaboration and social negotiations" (Jonassen, 1994). As a result, from a technological point of view systems, which support and augment collaboration and construction of peer-to-peer interactions, are to be enhanced and implemented in terms of blended learning.

The initial goal for using a discussion forum in a preservice teacher-training course was twofold. The first was to lead future teachers to dialogue outside the class using an interactive tool. The in-class lectures did not permit to continue many discussions among students. The course was structured as

follows: 4 traditional lectures (5 hours each for a total of 20 hours) integrated by online “meetings” which were supposed to be a valuable support to traditional lectures, rather than a replacement for them.

The second goal was to have preservice students become more familiar with technology, according to the course contents, and in particular to facilitate a collaborative learning among them. The use of shared-document online conferencing was thought to enhance a collaborative learning work and to prompt students to build communities of learners. The following goals guided the design of the assignment in the present study: fostering collaboration and thus contributing to a critical understanding of course material achieved individually as well as collectively; providing a forum where mutual support and social cohesion could be developed.

Participants and Procedures

The participants in the study were 28, belonging to three different teaching areas: 5 members belonging to music, 11 to science and 12 to gymnastics teaching. *The course was divided into three stages:* during the lectures (April-May) when students were asked to participate in an on-line environment of interaction. Then, they were given a collaborative task to be fulfilled by three periods (middle June, middle July and middle October). This study refers to a part of the overall class of students who decided to complete the course by July. The whole class was much larger and composed of 56 students, divided in 12 groups.

Students were asked to attend the traditional lectures and to participate in an online discussion forum, which started after the first lecture. They were asked to write assignments (two types of assignments: an individual one and another one as a result of collaborative learning), to upload their documents in the online forum, and to participate in debates and discussions about themes and topics they were interested in, above all topics regarding the course contents. This study focuses only on six groups. The teacher, with the support of three different tutors (one responsible for organisation, one for course contents and the third one for social support) made use of two important criteria to build student groups: they were supposed to be made of a minimum of 3 up to a maximum of six people, and their members were supposed to belong to different subject areas. These criteria were not strict and severe, but they referred to the pedagogical framework of the course. Finally, the instructor required students to make regular submissions to the course web site discussion board supported by *Yahogroups*.

This study concentrates on the strategies used by course participants in order to achieve the course contents, in particular to cope with the collaborative task assigned. Here, collaborative learning consisted of writing a first course paper focused on students implicit theories. Students were asked to answer some questions according to the following guidelines:

- 1) “To a secondary school student, learning my subject differs from learning other subjects because.../is similar to learning other subjects because...”
- 2) “To have success in my subject a student should ...”
- 3) “A good teacher in my subject should possess the following characteristics...”

The collaborative task foresaw three steps. Firstly, the members of each group had to write their own paper individually. Secondly, each member had to interact with colleagues belonging to different subjects in order to have a debate on the three specific requested tasks. Thirdly, each person had to re-write his own paper according to the interactions and discussions on the forum.

Purpose of this Study

This study has the purpose to understand if a CMC environment like an online discussion forum contains “supportive” elements, in particular if it promotes a collaborative learning and enhances a peer-to-peer support. Secondly, it aims at verifying if a CMC environment and thus on-line interactivity promotes the building of a community of learners. The following research questions were posed:

Q1 Can and to what degree may a CMC system promote a collaborative learning and a peer-to-peer support? Do peers use tools to interact with and support one another to reach the course goals and thus to construct new knowledge?

Q2 Can a CMC system enhance the building of a community of learners? Do participants use “supportive” strategies to create a community of learners?

In particular, all data concerning interaction, collaborative learning and peer-to-peer support were gathered

- to identify the type of interaction inside each group and among the other ones
- to identify the most favourite strategy of peer-to-peer-support in order to carry out the collaborative task

Methodology

Data gathering

In this study two sources of research data are reported: data relating to the messages posted by the participants and contributions that each participant attached and loaded.

The study was exploratory and attempted to investigate the online discussions, and interactions among learners during their collaborative learning process and the strategies of peer-to-peer support used by students. The number and content of contributions made by group members in their online interactions were analysed seeking utterances which indicated forms of peer to peer support and collaborative learning. Different strategies of peer-to-peer support were identified among the messages. The initially developed coding scheme for the analysis of participant interactions was mainly based on Johnson & Johnson (1996), Suh/Womans (2001) and Curtis/Lawson (2001). The scheme has been properly revised according to the specific learning context and the particular task assigned which aimed at promoting critical debates, students’ argumentations, and revision of their points of view. As a result, indicators for interactivity, support and collaboration were mainly considered. On the contrary, indicators for cognitive strategies and content (Henri, 1992) were in the background. The literature offers a number of coding schemes which had been trialed by other authors to measure: social presence in asynchronous text-based computer conferencing (Rourke, Anderson, Garrison, 2001), critical thinking (Fahy, 2002) and knowledge construction (Stacey, 1999). Since the primary concern of this study was the identification of peer to peer support strategies in an online environment, the present coding scheme is based out largely upon the components of interactivity/interaction and components of collaborative behaviour described by Johnson & Johnson (1996). While interaction processes were being analysed, the coding scheme was refined. The final coding scheme had 21 subcategories. Overall, five main subcategories of supportive strategies were found out and here above reported:

Collaborative Strategies: Peer-to-Peer Support and Group Learning

Seeking Input

- 1) ask for feedback
- 2) ask for confirmation of something
- 3) pose a new question, new ideas and ask for opinion

Contributing (Offering Help)

- 4) offer of feedback
- 5) agree or disagree
- 6) reply a posted message
- 7) clarify a topic of a previous message
- 8) use of citations in support of one’s own argumentations
- 9) offer suggestion and advice
- 10) information about course contents, collaborative tasks, assignments, technological problems
- 11) quote opinions, documents, messages of peers

Peer Formative Assessment

- 12) comments on peer assignments
- 13) ask for correction

Providing Group Engagement/Support, Collaboration and Cohesion

- 14) invite peers to read posted messages and works loaded
- 15) invite peers to collaborate and cope with a common question, in order to find a solution together

- 16) invite peers to reply
- 17) express one's willingness to interact
- 18) invite peers to interact
- 19) Acknowledgement, recognising the helpfulness of peer assignments, comments and contributions of other
- 20) reassure peers on ones' duty (in peer review of peer assignments)

Social Interaction: Affective Responsives

- 21) thanks and forms of salutation

According to the list of collaborative behaviours identified by Johnson & Johnson (1996), the two first macro categories *Seeking input and Contributing* contain all strategies of peer-to-peer- support regarding giving and receiving help and assistance about the assignment and technical/organisational problems: discussion and commentary on the task/topic, such as exchanging resources and information or explaining elaborating information, referential statements, reflections, quotations, citations. The group *Peer Formative Assessment* is characterised by messages of monitoring each others' efforts and contributions like "You should deepen this part of your individual assignment", or messages of asking peer correction. The subcategory *Providing group engagement/support, collaboration and cohesion* contains all more interactive strategies used in order to provide a specific collaborative support, to advocate increased effort and perseverance among peers, to arrange interaction and challenge others' contributions-cognitive conflict and controversy leading to negotiation and resolution- like "What about reflecting together on this problem?" are included in this category. The last group is called *Social interaction* to indicate all *affective responsives* and messages in which social strategies are used, such as greetings, salutations, forms of personal help and solidarity. The data analyses had to demonstrate how interactive the discussion forum would be. Postings of each group were gathered and analysed according to the above-cited categories.

Results: Implications and Discussion

According to the research objectives data were analysed to verify if students used specific strategies to support each other in order to fulfil their final task. Not only did this study stress the high potentials of an on-line learning environment to promote interaction among peers and communication, but it highlighted the great amount of strategies used by students to support each other.

Students made use of the discussion area to send and receive messages to their peers, uploaded a huge amount of works in the *documents area* of the on-line environment (221 in total) and could share common materials and resources, such as documents they posted in their own personal file. Data suggested how supportive students were by uploading and downloading documents which investigated a particular topic they were interested in as a form of help for their peers.

The whole interactions inside each of the six groups amounted to 177 in 2 weeks. The number of interactions among the six groups was 201. These data show a first result: interactions among the groups were highly used by students to debate their convictions and opinions, and widen the discussions started in their small groups. Further, interactions were conducted by students who belonged to different subject areas according to the assignment criteria. This indicates that peer-to-peer interactions promoted critical debates and discussions among future teachers as a first step to interdisciplinary. It is to presume that the interactions among the six groups started when a member of each group looked for a more detailed feedback or tried to compare his point of view with other colleagues belonging to the same subject. On the one hand, they seem to look for support from their own subject area, on the other hand they seek for interaction with members of the subjects which were absent in their groups. As a matter of fact, a balance was established. Instead, inside each of the six groups students mainly looked for a comment coming from different subjects.

Data show for example that the first group used 133 strategies to support each other in order to fulfil the final assignment. As opposed to interactions inside the group in which members mainly used cognitive strategies, such as giving and asking for feedback, or expressing agree or disagree, collaborative strategies of support were preferred by students in the interactions with the other groups:

such as monitoring each others' efforts and contributions or inviting peers to express their opinion on a particular subject and to interact.

Overall, the most interactive and “supportive” group was the number six since 289 strategies of support were used in 84 interactions inside the group, whereas 412 strategies were practised in 98 interactions with the other groups. It was the group who registered both the highest number of interactions and the highest number of supporting strategies at all. It was a sort of *leader group* since the other groups mainly interacted with the member of this group to receive feedback and to participate in debates on their assignment works. The reason why so many interactions happened with members of this group depends on the high number of collaborative strategies used by their members. Not only did students belonging to the six-group limit themselves expressing agree or disagree towards opinions of their peers. They engaged in scaffolding, “warming” interactions, inviting peers to collaborate, offering solutions to their peers, evaluating and reviewing peer assignments. Moreover, students belonging to this group used three new types of strategies to support their peers, that is they asked for collaboration in reflecting upon common shared topics and finding a solution to common problems concerning the task; they voluntarily interposed in discussions and dialogues of peers belonging to other groups, and lastly they asked for correction.

Furthermore, the data show that some groups are more “active” than others, since the number of interactions highly differs from group to group. The different amount of interactions in intergroup and intragroup may depend on the specific characteristics of participants who belong to three different teaching and learning areas. Results from interactions and patterns analyses show a link between students’ participation and their previous studies. The relationship between learner participation and this variable was explored. According to the data, students’ curriculum may influence both the quantity and the type of interactions: data could show which of the three subject areas (music, science and gymnastics) interacted and supported their peers most. 638 amounted the strategies of support of future music teachers, compared to 361 strategies of gymnastics teachers and 300 of future science teachers. Although the number of future music teachers was the lowest (5 members opposed to 11 and 12), the *music group* was the most interactive and *supportive* so that members of other subject areas preferred to address to them in order to debate and receive support and feedback for their collaborative tasks. Moreover, the type of strategies used by the three areas were isolated in the initial phase when students began to interact inside each group and outside. Data show that “musicians” together with future gymnastic teachers are more likely to use collaborative and supportive strategies, to seek and offer support, to urge others to interact, to compliment and encourage. Instead, strategies used by “natural scientists” are more related to the category of argumentation and explanation- providing information, exemplifying, linking ideas and information, making analysis, comparing and synthesizing information, making assumptions and expressing agreement/disagreement. Actually, it may be assumed that students’ academic background probably affect learners’ discourse participation in an online discussion environment.

To sum up, the six groups used 630 strategies of support in order to gain their collaborative task. Instead, 787 strategies were used to support students belonging to the other groups. Overall, they mainly used strategies, such as expressing agree or disagree to peer opinions, posing new questions and ideas to the members of the group itself or giving/asking for feedback. Furthermore, a learners’ sociodemographic characteristic like students’ educational background- formal education- seem to have a great impact on the level of participation of the six groups.

Conclusions

The findings of this study suggest that the online environment planned for the course allowed for discussion, i.e intergroup and intragroup. Participants used social, cognitive and collaborative strategies to support each other; they invited others to join their conversation. They referred to the contents of each others’ postings and works. They asked and received feedback in order to fulfil their task. These findings suggest how students demonstrated willingness to encourage others to participate in discussions and to continue interacting. Not all the 28 participants and the six groups equally used the 21 indicators of support, so that some strategies were preferred: collaborative strategies among them. Significantly, all 28 students engaged in supportive interaction and found ways and strategies to

provide their peers for support. There was considerable variation in the use of these 21 strategies and techniques, depending on the nature of the task. Collaborative strategies, such as peer review and evaluation were particularly practised when peers requested a more detailed feedback on ones' assignment from their peers. Instead, forms of salutations and affective strategies, such as thanks and salutations mostly concentrated at the end of the threads in recognition of peer support.

Finally, this study shows how collaborative and interactive an asynchronous on-line discussion area could be. Students demonstrated willingness to share resources, to submit several drafts regarding both the assignment task and other topics, to participate collaboratively in review of the drafts, to negotiate with peers the focus and topic of the debates and discussion from an initial question to a shared discussion on that topic (thread). Overall, this study suggests how the present CMC environment was a way to promote reflection and critical thinking among peers, to provide tools and ways to support ones' own peers from a content- cognitive to an interpersonal point of view and to augment in future teachers the willingness to interact and revise their own opinions and beliefs through a rich dialogue and the support of their peers. Results show how the present CMC environment could enhance the building of a learner community in which collaboration, support and interaction were possible in favour of building knowledge.

Further Research

For future research, a long-term and large-scale study might be needed to confirm the findings of this explorative study. Also, an effort should be made to find out the factors which promote and facilitate collaboration among peers. Continued studies may help to develop collaborative learning strategies and provide evidence for a correlation of number of interactions with peer to peer support strategies. Further exploration is needed to determine the causal factors linking other sociodemographic variables with participation in online discussion environments. Other sources of information should be taken into consideration, such as questionnaires and interviews, in order to collect and gather student perceptions about the possible factors which promote and hinder interaction in computer conferencings. Finally, in a forthcoming study a significant comparison of an experimental group with the rest of the class will be provided.

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Authors:

Prof.ssa Maria Lucia Giovannini
Department of Educational Science- University of Bologna
Via Zamboni 34
40126 Bologna (Italy)
mlgiovannini@scform.unibo.it

Dott.ssa Michela Morelli
Department of Educational Science- University of Bologna
Via Zamboni 34
40126 Bologna (Italy)
michela_morelli@hotmail.com

PROMOTING INFORMATION AND LEARNING TECHNOLOGY IN TEACHER EDUCATION: A PILOT IMPLEMENTATION OF THE PRONETT PORTAL

Ton Koenraad, Utrecht University of Professional Education

Abstract

This paper reports the results of the pilot implementation of the web portal that is being developed in the PRONETT project by the Faculty of Education of the Utrecht University of Professional Education. The key objective of the EU project PRONETT at www.pronett.org is to offer a network approach for students, practising teachers and teacher-educators to collaborate and to construct shared understandings of teaching and learning in a networked classroom and institutional environment.

The Pronett portal is expected to offer a virtual infrastructure that supports teacher educators, student teacher and in-service teachers in the (co)production, execution and evaluation of practice based ICT-rich teaching and learning. Access to (the design process of) concrete learning objects will facilitate reuse of educational content and stimulate the dialogue between educational organisations and actors involved. This dialogue is seen as preconditional for the development and sharing of knowledge related to ICT related pedagogy in subject teaching.

Beside contributing to the Pronett specific project targets the implementation design for the Utrecht region also aims to contribute to the local realisation of ICT-rich, competence based Teacher Education Provision as benchmarked by the national representative board of Dutch Teacher Training providers, ADEF.

This paper and/or some sources referred to can be downloaded from: <http://publications.pronett.nl/publicdocs.html>

1. Introduction

The project 'Professionals Networking Education and Teacher Training' (Pronett) was initiated by Archimedes Lerarenopleiding, the department of the Faculty of Education in Utrecht, the Netherlands, responsible for the regional initial teacher training and continuing professional development for vocational and secondary education. For a better understanding of the motives for the project a closer look at the context in time and place may be called for.

The Pronett project definition was inspired by recent changes in Teacher Education Provision in Europe [4] and in the Netherlands [14] and in particular by the recent state funded Dutch Educational Partnership Project (EPS, 2000-2002). This national project was targeted at innovation of teacher education, provision of a solution to the shortage of teachers (expected to grow to some 15.000 vacancies in 2006) and the delivery of teachers with qualifications required by the changes taking place in (Dutch) schools and society. The competence to apply ICT in designing powerful learning environments was considered highly relevant in this respect.

At Archimedes Lerarenopleiding the EPSproject has contributed to the development of the current curriculum model based on close collaboration with regional schools. The model integrates subject studies and professional preparation and is nationally known as 'The Utrecht Model'. Its key elements are: partnership, competence based learning and training, customized study programmes, dual mode approach and lectureships. It aims to meet the requirements of modern higher education as defined locally as:

'...education in which students develop into starting professionals and which takes place in interaction with the professional field. The professional field is involved in formulating competences,

formulating and providing (study) assignments, giving feedback on students' results and in the assessment and development of knowledge. Students carry out assignments in the role of the starting professional, which means that they produce work of a high level and that they can demonstrate that their work meets relevant current standards. ICT is an important tool in creating a rich learning environment as well as in creating the necessary conditions: the use of ICT makes it possible to organise educational processes differently.[5]

Monitoring of ICT developments in (Teacher) Education

For the evaluation of its ICT policies the Ministry of Education commissions various studies, among which the ICT-Education Monitor [10]. The EPSproject, being a major national project, was subject to an additional, dedicated monitoring procedure carried out by the Inspectorate. The first interim report was highly critical of the developments in the ICT domain of the EPSproject.

The main points of criticism can be summarized as: ICT as a didactic tool has not been adequately integrated in the teacher training pedagogy. Trainers' ICT expertise is at the level of basic skills, excepting those involved in expert centres. Student teachers are not adequately prepared to apply ICT in their future careers. Collaboration with schools and (international) collegial networking are scarce.

2. The EU-project PRONETT

2.1 Project goals

Coalition to define an EU-project with international partners was triggered by the urgency for action emanating from the various monitoring reports and the developing (ideas for) national benchmarks for ICT rich Teacher Education [8, 6] on the one hand and the lack of local educational leadership in the ICT domain on the other.

The project's aim is to develop a regional and cross national networked learning community of pre- and in-service teachers and teacher educators in Primary, Secondary and Vocational Education. A web portal offering a virtual infrastructure that supports the (co)production, execution and evaluation of practice based ILT-rich learning is seen as a facilitating instrument. With access to a variety of web-based resources and tools to support collaborative inquiry into and facilitation of the discourse on learning to teach in a networked classroom .

In line with the participatory model of modern higher education [2] the portal is expected to help the student teacher to realize her role as a starting professional [5] in the domain of information and learning technology.

2.2 Pronett Web Portal

The multilingual Pronett portal is a customized version of the Zope-based Content Management System 'Plone'. The inspiration for the design of the portal has come from an analysis of the local needs observed by the project partners and a literature study [7] on relevant project related issues in Europe such as ICT training and tools in schools, teacher education, virtual community development and school needs. Other considerations refer to critical features of successful professional development approaches in the ICT-E domain such as: needs based, learning by doing, enabling 'design & try-out & evaluate'-sequences, on-the-job elements promoting reflection and feedback (also in networks of teachers) [3].

Members have access to personal workspaces to which all sorts of content-types (file, picture, document, forum tool etc) can be added and be published.

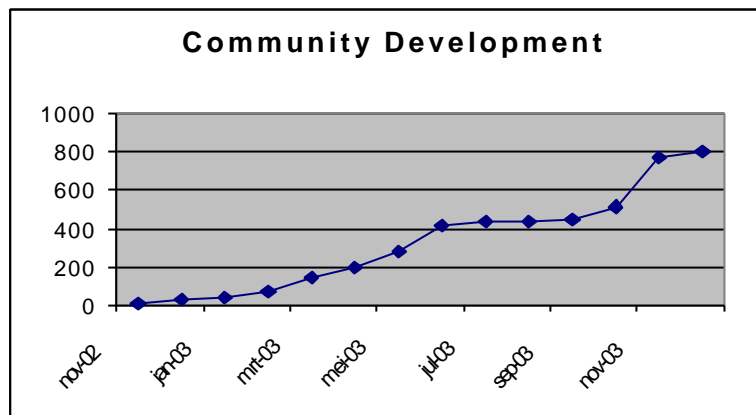
The automated registration feature of this Open Source software is considered important in this respect as it makes students and individual teachers less dependent on the software provision of their Teacher Training provider and/or at their placement and workplace schools. Especially in a competence based curriculum model this independence is essential as it offers users possibilities to experiment with web based teaching regardless of the presence of (or access to!) a local virtual learning environment (VLE).

It also opens up possibilities for individuals to solicit for alternative ways of help or coaching in the event of the (not so unlikely) absence of adequate local support, specific expertise or tutoring.

It will also help to disseminate the project as there are no administrative obstacles for teachers and student teachers of other organisations in the European member states to start participating.

2.3 Portal Membership Development

In the first 12 months since its first publication in November 2002 some 750 students and teachers have taken out an account on the portal. After a gentle take off in December 2002 when a number of Cardiff students began using the portal a growth spurt in the period between March and June 2003 marks the start of the pilots by the partners in Belgium and Holland. With the holidays approaching



Membership stopped at 455 in July. Then in October, with academic life picking up speed again, an international cohort of some 250 new arrivals came on board. As system maintenance has been carried out over time in terms of removing double or dead accounts (due to failed registrations) this graph gives some idea of the quantitative scope of the project in its first online year.

3. The Utrecht implementation of Pronett

3.1 Context, goals and strategies

Next to contributing to the general PRONETT Project objectives the Utrecht based project partner defined targets to support the further development of the Utrecht Curriculum Model. The workplace related activities are seen as the best part of the curriculum through which the teacher education institute can realise a practice based development of ICT-E competences and at the same time contribute to developments in the ICT-E domain at regional schools. Ideally workplace based learning is ICT-rich and facilitates the student teacher in bringing innovative practices to the school and contributing to school defined needs. The pilot implementation phase was expected to evaluate the feasibility of using school based defined needs as input for curriculum activities and to contribute to the evaluation of the Graphical User Interface of the web portal.

An implementation plan was developed in line with the guidelines described by Collis & Moonen [2] that have been adopted as a generic Pronett implementation approach. A combination of top down and bottom up strategies was applied. To reach the goals mentioned two types of activities were carried out: teaching experiments by teacher educators and activities by a working party to operationalise regional collaboration.

3.2 Results

3.2.1 Pilots at Archimedes Lerarenopleiding

Eight teacher educators in 6 different teams were approached. The portal functionality was presented by Pronett team members in individual sessions to those teacher educators (n=4) who decided to

actively participate in the pilots. Three teacher educators wanted to use the portal to support one of their courses involving the production of web based materials. One teacher decided to experiment with the provision of virtual support for a (student) live conference.

After having selected a particular course the teacher educators and the Pronett coach collaboratively developed ideas and the related functional specifications for the online support of this course. The technical implementation of the support structure was then realised by the Pronett team (for an example see Fig. 2. below). Some training was given to develop vital skills for the realisation of their role as e-moderator (e.g. uploading relevant documents, presentation of links, placing last minute messages, allocating rights to individual students for specific folders).

For those courses that required students to develop web-based materials specific templates (WebQuest, E-zine format) were developed. Partly to avoid the need for training students in the use of yet another piece of software beside Pronett (e.g. FrontPage) and partly to facilitate the publishing process of those materials within the Pronett environment.

For more information on the implementation pilots in the Modern Language Department see [9].

3.2.2. Regional Collaboration

With the aim to further operationalise the ICT-rich workplace based learning concept a working party consisting of the Archimedes implementation team and ICT-coordinators from 4 regional, affiliate schools has explored the feasibility of using school based defined needs as input for curriculum activities. This has resulted in an inventory of (pre)conditions for the implementation of school defined curriculum tasks, a (concept) list of school defined ICT-needs and a description of the tasks and responsibilities for the actors involved in the task definition and coaching of the developmental work by student teachers.

3.2.3. Evaluation of the Graphical User Interface (GUI) of the Pronett Portal

Various instruments (online questionnaire, interviews, written evaluation forms, observations) have been used to collect information about user experiences with the interface. On the basis of the analysis of these research data some improvements have been made to enlarge the intuitiveness of the portal interface and the personal workspaces in particular. In educational terms it appears that to benefit maximally from the functionality offered when the portal is used as a Virtual Project Room Environment (VPRE), teacher educators and students alike will have to be explicitly introduced to some of the available features to become confident and independent users. For similar findings see [12].

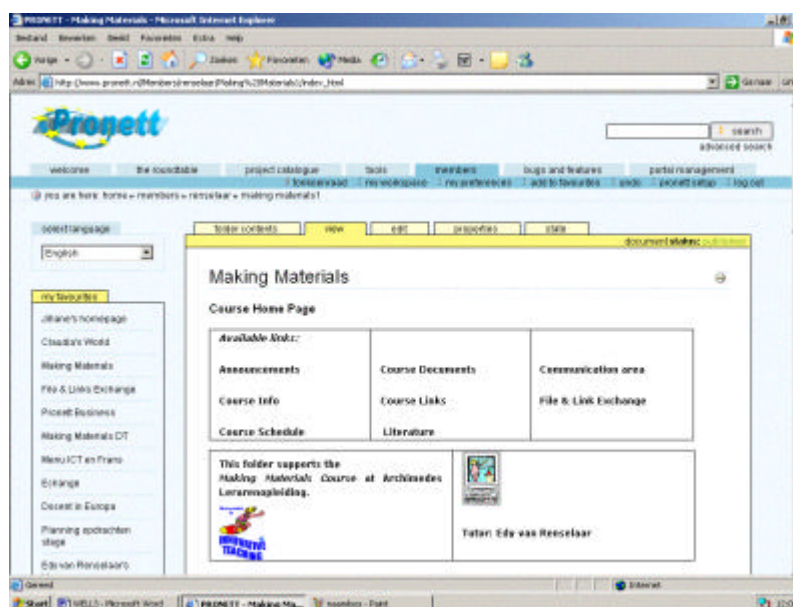


Fig.2 Folder in Trainer's workspace to support a materials design course.

Informal evaluative remarks by teachers involved also indicated that students found it confusing to learn to work with a new GUI and the custom made WebQuest template provided simultaneously.

Trainers reported to have lacked the time to use the course support site provided in their workspace to actively experiment with e-learning and online moderating.

Facilities to approach students in the course as a group were missed.

4. Discussion

4.1 Flexibility

The experiments have shown that it is possible, with only limited developmental work, to use the portal to support such diverse contexts of use as:

- an online support for 'traditional' courses
- the provision of tools and publication facilities for educational design courses
- the collaborative production of web based materials by teams
- a stimulating environment for task based language learning activities
- virtual facilities to support a (student) f2f conference such as pages for plenary and collaborative activities and personal and project team-rooms

Experiments reported by other project partners include tele-tutoring and extranet applications.

This flexibility is seen as an advantage over standard VLEs and is well appreciated by the competent ICT-users. This very feature, however, also causes problems for less sophisticated users. Some of whom – in the context of a particular course - felt that the options offered were not in balance with the tasks required or even frustrated an efficient realisation.

4.2 The trans-national dimension

At this stage of development (limited number of users, activities and materials) students nor teachers, after being informed of the portal's existence, apparently start using it of their own accord. We assume that as yet things will only get going through curriculum based impulses, i.e. teacher educators who take the initiative to embed use of the portal in their teaching and define explicit tasks and activities for students to do. Hardly any observable communication takes place even within the same language community, let alone trans-nationally. It is, as yet, not known how users feel about the concurrence of various languages in content objects such as forum messages and published projects.

This does bring home, however, the complexities involved in developing a distributed community of practice across organisations [13]. As similar observations have been made by other project partners development of local community cells will be given priority as of September 2003, as the existence of active local groups is seen as preconditional for the germination of an international dimension.

On the other hand, now that some of the educators, after the pilot, realised the chances offered for international collaboration and educational projects, internationalisation and authentic use of foreign languages for language learning existing courses are expected to be adapted to include these goals. This suggests another strategy to be explored at project level: the teaming up between partner based teacher educators responsible for comparable curriculum activities and the involvement of e-twinning schools.

4.3 Further efforts needed

Although the portal could compensate for the absence of a local VLE and supports the realisation of educational ICT-based design projects, full implementation is not likely to occur if the prospective users are not convinced of its added value over installed ICT-facilities for students, teachers and

educators. In this context the possibility of developing the learning object database for local and international support for knowledge sharing on the design process (making professional feedback visible) and facilitating resource based teaching (meta-evaluation of final products) should be more explicitly highlighted. Another argument that can be put forward relates to competence development. Anticipating the further (local) development of competence descriptions for teacher educators and teachers [3, 11] the portal offers opportunities for autonomy in the development of attitudes and competences relevant in the near future for both students and educators that current standard VLEs do not provide. Examples are: functioning in or monitoring local communities of learning, e-moderating students/pupils projects, using the internet for personal professional development, designing learning activities using Learning Objects, practising Resource based teaching, preparation for contributing to and using Learning Object Repositories [1]. Active management support and well-planned change management targeted at realising a joint effort of all organisations involved (local teams and affiliated placement schools) and levels of application will be needed [8] to develop a position for the ICT-E domain within the learning organisation potential of the Utrecht Model.

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Author

Ton Koenraad (M.A.)
Utrecht University of Professional Education, Faculty of Education
Archimedeslaan 16
3584 BA Utrecht, The Netherlands
Ton.Koenraad@feo.hvu.nl
<http://www.feo.hvu.nl/koen2>

ONLINE TEACHER PROFESSIONAL DEVELOPMENT: FROM RESEARCH INTO PRACTICE

Aleidine J. Moeller & Ekaterina Koubek, University of Nebraska-Lincoln
& Stefan Brunner, Goethe Institut, Washington DC

Historical Context

The raising of academic standards for students and teachers was made a priority by state and national policy makers in the United States. A report of the Presidential Commission on Educational Excellence declared the quality of education in American public schools as experiencing "a rising tide of mediocrity" (*A Nation at Risk*, 1983, p. 5). The individual states responded with "accountability" directives and legislative initiatives establishing mandates in educational policies. State and national reform efforts resulted in a variety of initiatives in major content areas, notably the development of a set of standards in most disciplines including foreign languages. Content standards for foreign language students in elementary schools through college (K-16) were established in an effort to address articulation issues in moving from one level of instruction to the next. These standards were designed to ensure a gradual building of language proficiency and fluency.

The American Association of Teachers of German (AATG) and the Goethe House New York, realizing that tougher standards would not lead to better schools unless delivery standards and standards for practice received equal attention, developed a vision for strengthening the German teaching profession. Professional standards were drafted and guidelines for the development of programs for the preparation of teachers of German as well as for continued in-service professional development were developed. In order to assist teachers to make progress toward these standards, the AATG and Goethe House New York embarked on a long distance learning project that would enable teachers to have access to professional development materials and courses. These high-quality distance learning courses were to improve German instruction and ultimately enhance student learning.

Building on a collaborative project (entitled *Fernstudienprojekt zur Fort- und Weiterbildung im Bereich Germanistik und Deutsch als Fremdsprache*) initiated by the Goethe Institut München, the Institute for Distance Learning at the University of Tübingen (DIFF), the University of Kassel (GHK), the German Academic Exchange Service (DAAD), and the Center for German Foreign Schools (ZFA), an AATG/Goethe Institut task force was named in 1993 to explore efficient and effective implementation of U.S. standards for foreign language education. The task force consisted of individuals representing K-12 and post secondary education as well as Goethe Institut and AATG representatives. Initial funding was obtained through the *Ständige Arbeitsgruppe Deutsch als Fremdsprache* (StADaF). The original objective of the task force was to adapt and regionalize the existent *Fernstudienbriefe* for the U.S., to enable and promote the preparation of foreign language teachers to meet the new Professional Standards for Teachers of Foreign Languages and to assist in preparing teachers for the implementation of technology in their classrooms. Additionally this venue was intended to promote life long learning and to create a community of learners among German teachers who often are the sole German teacher in the school or school district.

A panel of international experts consisting of technologists, distance education specialists, foreign language pedagogy specialists, K-16 German instructors and curriculum specialists were appointed to advise and oversee the development of the project. After several iterations ranging from satellite, audio bridge, print materials and video projects, the Internet was selected as the delivery mode for professional development. In 1996 and 1997, two grant proposals were funded by the European Recovery Plan from the Federal Republic of Germany. The fiscal agents were the American Association of Teachers of German and the Goethe House New York.

The project, named GOLDEN (German On Line Distance Education Network), aimed to develop six online courses in the area of German language pedagogy modeled on the *Fernstudienbriefe* noted

above. Based upon a survey of the AATG membership, the task force selected the following six courses for professional development purposes: Writing Pedagogy in the German language classroom; Speaking Pedagogy in the German language classroom; Listening Pedagogy in the German language classroom; Reading Pedagogy in the German language classroom; Instructional Planning and Learning about and Using the Internet in German Instruction. Content experts were selected to develop the curriculum. To ensure on site support and collaboration, two specialists in close geographic proximity per course shared responsibility for developing the content. A week-long workshop for all authors and technologists was held at the University of Nebraska-Lincoln to review and revise the pedagogical and conceptual undergirding of the project. This workshop succeeded in building a sense of community among the stakeholders of the project and established an agreed upon format, navigation system, assessment, and content to ensure consistency across courses.

Upon review of the *Fernstudienbriefe*, it became apparent that major revisions had to be made to these distance modules in order to make them applicable to an American audience and to fully optimize the medium of technology. Essentially the content of the courses was newly created, recreated or adapted by the authors of the individual courses. *Instructional Planning and Learning about and Using the Internet in German Instruction* were created as completely new courses, whereas the other four adapted selective and varied, but in all cases, limited pieces of the original *Studienbriefe*.

Pedagogical Issues

Research revealed that intentional interaction is essential to learning (Moeller, 1996; Laws, 1991; Redish, Wilson, McDaniel, 1992; Nunan, 1988). According to Weimer (1993), "when students are learning actively, they learn more, retain it longer, can apply it better and continue learning" (p. 49). Kruh and Murphy (1990) reported "quality distance education is dependent upon the interaction and participation of the learners, similar to traditional face-to face instruction. It is essential that the distance educator purposefully design this essential ingredient into the instructional program" (p.6). Access to information is not enough, it must be "shared, critically analyzed, and applied to become knowledge" (Garrison, 1990, p. 13).

Communication between instructor and student and among students is central to the learning process, even more so in a distance learning setting. Research indicates that the model that optimizes learning is one of teacher as "coach" of the students' learning process (Pea & Gomez, 1992; Laws, 1991; Valette, 1994). The teacher is actively involved in helping learners construct their own understanding of the content and curriculum material. This is maximized when the teacher and student have available to them a variety of communication tools to enable the coaching process.

Learners bring with them a highly developed set of beliefs and preconceptions. The teacher and the learner become involved in a learning dialogue in which meanings are negotiated to enhance an understanding of content and curriculum. Such interactions can be promoted most effectively by providing learners with access to powerful technology tools that allow the learner to interact with real data and solve open-ended problems. Learning-by-doing has been shown to be a successful pedagogical model to enable students to solve real world problems (Laws, 1991; Redish, Wilson, McDaniel, 1992). This learning-centered view allows the students to start with what they know and build their own understanding of the content. As GOLDEN teacher participants became acquainted with the resources on the Internet and the vast authentic materials available in German, they used these materials in their classrooms to build German language and culture proficiency among their learners.

After a thorough review of the research in distance education, teacher education and second language acquisition, the project participants agreed upon a three-stage pedagogical model: Experience, Reflection, Application. (ERA). These three stages promoted a hands-on, interactive, problem-solving approach in which the course participants assumed the dual role of learner and teacher. The tasks built into the courses placed the teacher-participants in the role of the learner; for example, in the *Instructional Planning* course when course participants were learning about the use of visuals in assisting the decoding of texts, the examples were presented in Spanish in order to place the teacher in the role of the learner by making him/her an actual consumer of the theory. The course participants then reflected on what they learned and how and why it was learned. The conference discussions were reviewed by all participants and stimulated peer learning and inquiry. The course participants were

then asked to apply the strategy learned (e.g. using visuals to introduce vocabulary) in their language classrooms and to share their experiences and observations via asynchronous discussion board. Action research studies were conducted by the teacher participants and results shared in the conference room. These discussion forums optimized peer exchanges and resulted in a more learner-centered environment. The role of the instructor became one of posing questions of the participants in order to probe deeper into their beliefs and responses and to promote a higher level of critical thinking. Since all responses were permanently archived, the instructor could refer course participants to peer responses and ask them to compare and contrast responses and why these responses might vary and differ from their own. Such individualization of teaching gave equal voice to all participants, unlike face-to-face instruction, where a few individuals in a classroom can dominate a discussion. The interactivity required a variety of forums that maximized student thinking and responses. The courses were divided into "Explorations," or chapters that contained research based content on the topic interspersed with "tasks" to be completed by the participants. The responses to these tasks either appeared in the conference room, on the discussion board, or were sent directly to the instructor, depending on the purpose of the task. Resources, schedules, information links and technological assistance were available with a stroke of the keyboard. With advancements in distance education, newly emerged tools were added to support teaching. These technological changes together with changes in pedagogy, provided a dynamic environment for professional development of teachers.

In 1987, the American Association for Higher Education published "Seven Principles for Good Practice in Undergraduate Education," which distilled findings from the research on the undergraduate experience. Chickering and Ehrmann (1996) revised these principles to enable those using new information technologies to improve the teaching/learning process. These principles have been integrated in numerous research studies and in a variety of publications on good practice. These seven principles served as guideposts in the development of the GOLDEN courses: good practice encourages contacts between students and faculty; good practice develops reciprocity and cooperation among students; good practice uses active learning techniques; good practice gives prompt feedback; good practice emphasizes time on task; good practice communicates high expectations; good practice respects diverse talents and ways of learning.

Inquiry into Teaching and Learning: A Constructivist Approach

The traditional view that knowledge can be transmitted from the teacher to the learner has been displaced by a critical and collaborative approach to constructing meaning (Garrison, 1997). The constructivist approach focuses on learners making sense of new experiences by integrating them with prior knowledge and then sharing this new meaning with others: "learners must think critically and creatively but also work collaboratively" (Garrison, 1997, p. 8). Meaningful learning is best achieved in collaborative settings where students' misconceptions are revealed through discourse. Individual responsibility and control along with authentic communication is the essence of a constructivist approach to learning (Garrison, 1997). A key factor in online learning for educational purposes is understanding the relationship between written communication and cognitive development. Applebee (1984) notes, "it is widely accepted that good writing and careful thinking go hand in hand" (p. 577). White (1993) argues that "writing as an advanced skill becomes both the means and the expression of critical thinking and problem solving" (p. 106). The asynchronous nature of the GOLDEN courses is consistent with higher order thinking and cognitive development. Since the messages are stored, learners have access to this information allowing time for reflection and encouraging them to make connections among ideas and to construct coherent knowledge structures.

Collaborative learning constitutes a significant shift from traditional approaches to teaching and learning. With roots in social constructivism, its primary theoretical foundation originates from the teachings of Lev Vygotsky. Social constructivism accepts the notion that the individual constructs his or her own knowledge, but notes that the process of knowledge construction takes place in a sociocultural context (Reagan, 1999). Creating a collaborative and supportive environment within an online course is dependent upon three main moderating functions: contextualizing, monitoring and meta-communication (Feenberg, 1989). The context provides the general organization or communication model as well as focusing the discussion. Monitoring focuses on recognizing and prompting individual

contributions. Meta-communication concerns itself with relevance and weaving comments that make connections and summarize discussions.

Designing and delivering distance higher education within a constructivist framework requires a rethinking of the learning environment. The advent of the World Wide Web together with constructivist views places increased demands on students, instructors, and the ways in which they process this particular Web form of knowledge (Fetherston, 2001). Constructivism suggests that individuals create their own understanding of the world. This, in turn, impacts on how they act in relation to this world (Young and Marks-Maran, 1998). Kelly (1995), a well-known proponent of constructivism, argued that new knowledge is linked to old knowledge through cognitive constructs and that it is through these constructs that individuals make meaning of the world. A key issue in the application of computer conferencing for educational purposes is understanding the relationship between written communication and cognitive development. Fulwiler (1987) suggested that "writing is basic to thinking about, and learning knowledge in all fields as well as to communicating that knowledge" (p.1), while White (1993) argued that "writing as an advanced skill becomes both the means and the expression of critical thinking and problem solving" (p. 106).

The reflective and explicit nature of the written word is a disciplined and rigorous form of thinking and communicating. These characteristics suggest that the writing process is particularly appropriate for higher education. Moreover, since computer conferencing is based upon written communication, it too may well be a potentially powerful technological ally in facilitating higher order thinking and learning (Garrison, 1997). It would appear that the asynchronous (i.e. reflective) and precise nature of this means of communication is consistent with higher order thinking and cognitive development. Since the exchanges of messages are stored, learners do not have the burden of remembering the points made by other speakers while waiting for their turn to speak. This promotes time for reflection and thereby facilitates learners making connections among ideas and constructing coherent knowledge structures.

Building on this research, six graduate level GOLDEN courses (see <http://golden.unl.edu>) were developed and piloted with in-service teachers over six semesters. Research was conducted to determine how in-service teachers of German constructed knowledge and how this knowledge transformed their teaching, their beliefs, and their sense of themselves as professionals. Hargreaves and Fullan (1992) duly noted that teacher development involves more than changing teachers' behavior, but is also a process of personal development that must include an examination of attitudes and beliefs.

GOLDEN: A Study of the Beliefs and Practices of German Teachers

The majority of what is written about distance learning in higher education consists of opinion pieces, how-to articles and second-hand reports that rarely include original research with subjects who are being studied (Merisotis & Phipps, 1999). Other studies have focused on how to develop, implement, and fund programs (Sherry, 1996), instead of centering on student learning (Fetherston, 2001). Garrison (1997) noted that many methodological questions still remain unanswered regarding the use of computer conferencing in facilitating higher order thinking skills. Winitzky and Kauchak (1997) suggest that connections between constructivism and student learning are underdeveloped. To fully understand these connections the voices of students who were involved in a constructivist on-line course need to be heard. For this reason a multiple case study investigated four in-service teachers' instructional practices, beliefs, and reflections in the GOLDEN on-line *Instructional Planning* course (Koubek, 2002). During the course, the in-service teachers were challenged to apply theory of foreign language pedagogy into practice in order to improve their instruction and student learning. One of the major objectives of the course was to raise questions and encourage teacher participants' reflexivity about what, why, and how they teach German. The data sources were triangulated to reveal the following categories: role of the textbook, role of the foreign language standards, the teaching of vocabulary, the teaching of grammar, task structuring and sequencing, lesson planning, lesson implementation, grouping, and assessment. These were the areas in which the in-service teachers showed change, or improvement over the course of the semester. The data were collected through extensive, multiple sources of information, including interviews, on-line observations, teachers' narratives, videos, course documents and artifacts, and e-mail communication between the participants and the instructors. The case study covered a time period of seven months. One participant was studied

at a time, moving from single to multiple case analysis. Since qualitative data collection, data analysis, and narrative reporting writing drive each other, the basic assumptions of qualitative analysis holding that data collection and data analysis occurred simultaneously. The matter of reduction and interpretation was an important process of data analysis in this study (Marshall & Rossman, 1989). Time series analysis was used (Yin 1989) in which changes in a pattern were traced over time.

Three research questions were investigated: How can an online professional development course improve instructional practices of in-service teachers? How can an online course affect an in-service teachers' belief system? How does an online course address teacher reflectivity? Koubek's (2002) findings summarized briefly below offer important information regarding the impact of one online professional development on teacher beliefs, reflectivity and instructional practices:

Name	Instructional practices	Beliefs	Reflectivity
Ann	Improved in teaching vocabulary using non-traditional approaches (e.g. TPR and TPRS); began using group-work activities; sequenced activities better; addressed different student needs and styles; used more alternative assessment such as oral proficiency interviews	Began to perceive students as partners, sharing teaching responsibilities with them, involving them as co-constructors of lessons; trusted more non-traditional teaching approaches; however, lacked teacher-efficacy, a belief that a teacher could make a change in student learning	Expanded her views based on self-reflection and constructive criticism from peers and instructors; felt responsible for her student learning; executed more "reflection-on-action"; however, did not always tie theory to practice; was more concerned with student behavioral issues; was more descriptive in her analyses
Monica	Became more confident and cognizant in using FL standards and non-traditional teaching strategies; became more precise in stating her expectations for group work; more theory-based sequencing of lessons; aligned her lessons to student styles and needs; scrutinized her testing system more	Continued to perceive students as individual explorers; believed in learner-centered classroom with teacher as a facilitator; was eager to broaden her knowledge on instructional practices despite being a self-confident and experienced teacher	Meticulously reflected on instructors, students and peers' feedback; used self-reflection to improve her teaching and student learning; felt responsible for learning theory and applying it to practice; provided equal opportunities for students; was very analytical, reflective in her analyses
Alice	Became less textbook dependent; used more authentic materials and learner-centered activities; made more conscious decisions in assessment procedures	Began to see her students as discoverers of new information; believed in hands-on, learner-centered instruction and saw herself as role model	Concerned with political and ethical issues, was concise but analytical in her analyses; felt responsible to her students and teaching profession; was open to constructive feedback
Liesl	Became less textbook dependent; used more non-traditional methods in teaching vocabulary and grammar; more pair-work activities; sequenced lessons better; addressed variety of learning styles; altered her assessment procedures	Began to see her students as partners; started to believe in more learner-centered classroom with students as co-constructors of knowledge; tried to embrace different learning styles of her students	Reflected on activities during and after lessons; was open to constructive criticism and incorporated suggestions into her teaching; was concerned with student affective domain; was less articulate but tied theory to practice

Future Directions

The courses developed by the GOLDEN project have been developed, taught, researched and revised after the initial/pilot teaching by authors/professors from institutions of higher education across North America that include Ohio State University, University of Washington, University of British Columbia, Dartmouth College, University of Nebraska-Lincoln, Fairfield University, the University of Delaware, and Mt. Holyoke. One of the benefits of this project is that a growing critical mass of individuals has emerged who understand distance education, technology, pedagogy and how to use this information and experience to make quality professional development accessible to classroom teachers. The initial six courses developed for GOLDEN were designed as graduate courses that could lead to a Master's degree through the University of Nebraska-Lincoln (UNL). These courses thus far have reached participants from 23 states and four countries outside the U.S. At present eleven individuals are pursuing a Master's with an emphasis in German language pedagogy through UNL.

Many teachers, who already possessed graduate degrees and who sought continued professional development, expressed the need for shorter modules aimed specifically at topics of relevance to classroom teachers. As a result, funding was sought and secured to develop four-week modules based on the original graduate courses. Authors, past participants and additional content specialists were brought together at Dartmouth College over three summers (2002, 2003, 2004) to develop these modules. At the same time, new facilitators were trained to teach these four-week modules. This has resulted in the development of 25 four-week non-credit modules available to German teachers worldwide to expand their knowledge and experiential base in the teaching and learning of German.

The most recent innovation is the anticipated development of a course that will be cross listed across colleges, allowing teacher participants to take the course (*Kinder/Jugendliteratur im Unterricht*) in the German department, or the College of Education. Such a course would offer simultaneous renewal in both pedagogy and language/literature learning. The *Kinder/Jugendliteratur* course will be authored by a team of content and pedagogy specialists. Potential topics for future development include *Assessment, Testing and Evaluation*; *Interkulturelle Didaktik*; and *Literatur im Unterricht*.

Collaboration with the Goethe-Institut Wellington has culminated in an upcoming offering of a GOLDEN module for 8 New Zealand German teachers in March, 2004. The facilitator of this module was a participant in an original GOLDEN course and trained as a facilitator at the Dartmouth workshop (summer 2002). This unique collaboration among three agencies, the AATG, Goethe Institut and the University of Nebraska-Lincoln is the key to sustaining this project and will ensure continued development and expansion. These three organizations share responsibilities in the arena of developing, researching, marketing, securing resources and offering quality professional development opportunities to German teachers on demand. Ongoing research (e.g. experimental, descriptive, correlational, case studies) studies, such as the one reported above, are critical to building a knowledge base of how technology can assist in promoting best teaching practices and will guarantee continued evolution and improvement of professional development for classroom teachers worldwide.

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Authors:

Aleidine J. Moeller
Ekaterina Koubek
University of Nebraska-Lincoln
118 Henzlik Hall
Lincoln, NE 68588-0355
USA

Stefan Brunner
Head of Language Department
Goethe-Institut Inter Naciones
812 Seventh Street, NW
Washington, DC 20001
USA

LEARNER SUPPORT AND PROMOTION OF TRANSFER IN THE DISTANCE LEARNING PROGRAMME “PSYCHO-SOCIAL ASPECTS IN NURSING”

Wolfgang Fichten, Carl von Ossietzky University of Oldenburg

Abstract

The paper describes an open and distance learning programme for health care professionals developed by the Centre of Distance Education. The course consists of a self-learning component in the format of open and distance learning as well as of integrated weekend seminars. Within their learning process the participants of the programme are supported by the mentors in charge who help them to work out possibilities of content application regarding the contents of the course. The support of transfer motivation is an integral part of the course design. The results of a transfer evaluation are presented. They allow to draw conclusions concerning learning success of the participants and quality of courses of further education.

The Oldenburg Open and Distance Learning Programme “Psycho-social Aspects in Nursing”

The academic in-service learning programme “Psycho-social Aspects in Nursing” was developed by the Department of Psychology and the Centre for Distance Education at Carl von Ossietzky University of Oldenburg. It is offered and conducted by a network consisting of one Swiss and eight German universities (Bernath, 2000). The training course is based on regularly revised printed course material for independent study as well as on compulsory weekend seminars, which apply the course content to nursing practice. A course unit or module was defined quantitatively as 60 – 80 pages for 20 hours of self-instructional learning. The authors of the modules were university faculty and outside experts. They were supported by experts in instructional and text design. The course consists of six modules on the topics “Relation between body and soul”, “Reflecting the role as a helper”, “Illness in its social context”, “The art of mindful communication” and “Influencing patient behaviour”. The course was carried out with nurse practitioners in a non-degree programme for professional development, which formed a 220-hour training programme undertaken over 6 months with six integrated seminars.

The aim of this course is to promote the psycho-social professional competence of nurses. The course contributes to professionalization by aiming at the development of a psychologically oriented health-promoting knowledge that can be applied to many different professional situations. All in all the course furthers professional competence, manifest in the ability to critically analyse professional situations and to look at them from different angles. Expanding the professional action repertoire should contribute to improving and intensifying the contact to patients and other interaction partners. By integrating psychological knowledge in healthcare delivery, quality and efficiency of such services are increased and additionally, professional action will be geared towards promoting patient, or rather, client health.

Course Concept and Learner Support

The course is conceived as advanced professional training in an open and distance learning format, which consists of study materials and seminars. The programme aims at integrating individual learning processes into group communication during weekend seminars explicitly for professional training. At first, participants occupy themselves individually with study materials, working on exercises and contemplating how and in which professional situations they can apply conveyed knowledge (3-4 week-long individual and independent learning phases). The following seminars serve as a chance for

participants to encounter each other, as well as to clarify positions and to practice action strategies (social learning phase). The two components refer to each other. Within the seminars the mentors go into the particulars of the contents of the texts. Among other things they explain complex concepts and clarify questions of the participants. Furthermore they compare the written products of tasks, which are included in the given texts. Moreover they exceed the course material by showing further perspectives and working out connections to practice and their concretization.

In order to fulfill the above mentioned aims and claims the course text and the assignments must be designed accordingly:

- The theoretically founded approaches and concepts discussed and taught in the course are to be grounded in the professional practice of nurses. This is achieved by presenting examples of application and giving advice for putting them into practice.
- Assignments do not pre-eminently aim at reproducing transmitted knowledge but focus on transferring the subject matter to the specific circumstances of the professional context in question. Thus e.g. participants were asked to observe a patient over a certain period of time and to make a case study of the data by applying certain given criteria. Among others they were asked to analyse the structure of relations between the staff of their ward and to give an account of their own ways of coping with professional stress. The authors' comments on the solutions were passed on to the participants. These comments presented the chance to influence the professional competence of the participants and to counsel the transfer processes.

As the solutions of the assignments can not be standardized in a course concept like this the people assessing them must thoroughly consider each single case. Thus, however, the learning process reaches an especially high quality standard because the extremely individual and diversified learning processes of the participants are taken into account.

One of the instruments ensuring the quality of the course is the learning diary (Fichten, 2000). The participants are asked to enter their learning activities into a diary, as to intensify the acquisition and discussion of the contents of the texts. The assessment and comments on the text contents that the participants have to give are part of the reflection process by which they actively and independently integrate theory and practice. In addition the participants receive feedback by the mentors concerning their learning diaries.

Promoting Transfer of the Course Content

In a distance learning course designed as further education improvement of professional competence means an integration of theory and practice. Health workers, whom we can regard as nursing specialists, assess the knowledge transmitted in the course in the light of their professional experience; they relate it to their own professional practice and partly use and adapt it. A special characteristic of the course is that such a transfer is not only encouraged but also counselled. Participants are given advice during the transfer partly by comments on their solutions to given assignments. Thus in this course concept the mentor fulfils not only the function of a counsellor in the learning process but also that of a "facilitator of competence".

Participants should benefit from professional training in the long run, i.e. the every-day routine should change noticeably. This is the case when knowledge and expertise acquired within the training context or learning field (source) is applied in the profession or function field (target) (Wittwer, 2002). The requirements for interlocking learning processes acquired in training with the practical application of the learned are the following:

- The learning materials relate to professional practice, they contain authentic case studies, references to professional situations, strategy descriptions and models for professional procedures, allowing participants to recognize the practical relevance of the subject matter, to relate conveyed knowledge to their own areas of profession as well as to associate the latter with professional expertise (cf. Greeno, Smith & Moore, 1993).

- Impulses to reflect upon possibilities of application and implementation are necessary. The learning materials include reflection impulses, which encourage thoughts on knowledge application in the professional field during independent learning phases. Since not all areas of nursing can be addressed in the course materials, participants must generate possibilities of implementation themselves by undertaking cognitive operations such as building analogies, comparisons and contrasts. Within the constructivist transfer theory, this is called “constructing an area of subjective application” (Prenzel & Mandl, 1993, p.706).
- Transfer is supported in the social learning phase. In the seminars, the application of course content in the professional fields is explicitly be focused on transfer and the motivation for implementation is promoted. Transfer competence can be strengthened by appropriate measures. The components of such a transfer-oriented seminar design are, for instance, integrated phases of application planning, personal commitments and learning partnerships, which offer mutual support for implementations in the function field (Mähler & Hasselhorn, 2001; Preiser, 2000; Rank & Thiemann, 1998).

Knowledge acquisition is a prerequisite for transfer. “If something is not learned and practiced soundly, there is (...) nothing to transfer” (Steiner, 2001, p.196). Transfer therefore depends on the quality of learning processes, the depth of processing for presented information and the intensity of reflection carried out by participants for topic application in various professional situations. Since participants can introduce and discuss ideas for application, these transfer prerequisites, originating in individual learning processes, are enhanced and set in a social frame during the seminars. Training elements and action strategy practice (role-playing, simulations) emphasize the connection to professional practice.

If transfer depends on quality and intensity of learning and exchange processes in training for professional development, the extent to which conveyed knowledge and acquired skills are applied in the professional field becomes an indicator for learning success and therewith a quality criterion for advanced professional training (cf. Schroll-Decker, 1999; Uschatz, 1993).

Transfer Evaluation Results

Verifying transfer effects is difficult due to the following reasons:

- It is unclear how long it takes for changes initiated by advanced education to appear in practice, making it difficult to indicate a favorable investigation time period.
- It is unclear and difficult to determine the extent of transfer, because it is hard to make an exact distinction between skills and expertise participants had before training and what they acquired afterwards.
- It is not easy to make assertions regarding connections between advanced education and changed action strategies exhibited by participants in the work field, since a number of variables interact in practice. Their interaction is difficult to control, complicating the definite attribution of changes to advanced education participation.

Due to these reasons, evaluation of transfer is a complex matter. Principally, (a) participant knowledge, expertise and skills must be assessed before and after completing advanced professional training (Pre-post design). Parallel to (a), a profile of career tasks and demands must be created and potential changes during the training period registered (b). Finally, (c) individual transfer success must be tested (Baldwin & Ford, 1988). Consequentially, registering transfer success must occur in the work field, including judgements made by colleagues, superiors and external observers (Harney, 1997). Usually, the latter is restricted to questioning earlier participants, which delivers data on subjectively perceived transfer effects.

Evaluating transfer reveals advantageous and supportive, as well as inhibiting and hindering factors, which strongly determine extent and length of implementation and application of knowledge conveyed during training (cf. Barnett & Ceci, 2002). Not only do factors specific to the individual reveal

importance, but also factors with an institutional-organizational dimension. These factors can be consolidated in a “condition model for transfer” (Rank & Wakenhut, 1998, p.15f.; cf. Sternberg & Frensch, 1993). This kind of complex model was the fundament of a survey conducted with previous participants of the Oldenburg programme on “Psycho-social Aspects in Nursing”. Using an extensive questionnaire with 89 items, subjectively perceived changes due to course participation in the areas of personality, career role, relationship to patients and career satisfaction were assessed. Additionally, data regarding changes in institutions due to course participation as well as estimation and evaluation of transfer success was registered. On the basis of 192 analyzed questionnaires, several results from the participant survey are presented in the following.

Work Environment: From a transfer perspective, parameters describing the work environment are important, because they can either benefit or hinder the transfer process (cf. Rank & Wakenhut, 1998). According to subjective assessments, the institutions employing previous participants are characterized by willingness to innovate. Only 29.2% claim their workplaces show little, and 5.2% no open-mindedness towards changes. This complies with a high level of independence during task execution: 45.8% widely experience autonomy during work, 12% can work completely independently. This result is due to the relatively large percentage of participants in leadership positions. The ability to criticize is less appreciated: 40.6% admit that in their institutions the ability to make independent and critical judgements is hardly promoted. If one assumes that the newly conveyed views possibly imply criticism on existing routines, it could present an obstacle for transfer efforts.

Applying Course Objectives: 85.4% state they applied course topics in the work field, 78.6% admit also applying them in private life. The conveyed objectives and skills are especially used in the following contexts:

- Communication: Conveyed skills regarding a helpful way of leading conversations are implemented when making contacts to patients, working with relatives and during team meetings.
- Dealing with conflicts and stressful situations: The course conveyed strategies for effectively managing conflicts.
- Relationships to patients: Comprehension of the psycho-social situation of patients increased, allowing a more appropriate handling of difficult patient behavior. Patients are more strongly regarded as active partners compared to before course participation, emphasizing and facilitating the promotion of health.

Difficulties with Implementation: The professional training objectives are mostly used in situations, which participants can organize in a relatively autonomous manner. Personal contacts, communication and interaction processes especially belong to the latter. Difficulties with implementation and transfer are particularly due to institutional obstacles and blockades. Problems arise because of

- Institutional factors and circumstances particular to a certain workplace (e.g. lack of personnel and time, short stay of patients)
- A lack of interest shown by colleagues and superiors (e.g. the practicability of objectives is generally doubted)
- A clinging to routines (e.g. inflexible courses of work).

One can conclude that the general conditions of nursing and healthcare delivery must be changed and institutional and organizational transfer obstacles dismantled. This would give way to conveyed and acquired skills, allowing them to take influence on the work field.

In addition, according participant remarks the following areas reveal significance for transfer in practice:

- The objectives of the training program gradually fade, yet there is not enough time to refresh them
- Success comes middle-term, which means participants require patience to a certain extent
- Implementing objectives long-term without any feedback is hard to bear.

Graduates of the Oldenburg certificate programme see an implementation obstacle in fighting alone, the "lone-ranger approach". They are referring to an interface between individual application intentions and socially, or rather, organizationally determined application possibilities. Instead, transfer appears accomplishable on the basis of cooperation with colleagues. Innovations are more easily initiated and carried out when they are supported by the entire station team. For transfer support and assurance in hospitals one can, for instance, draw upon experiences made with so-called "setting conferences" (Siebolds & Weidner, 1998). They consist of members from various professional areas and are quite efficient, since work in hospitals is characterized by interprofessional cooperation and innovations must therefore be supported by all healthcare providers (Waltos & Waltos, 2002).

Concluding Remarks

Due to the focus on transfer, qualitative and didactic-methodical changes are emerging in training for professional development. Implementing and applying knowledge imparted during the training programme was mostly considered the job of participants until now, and therefore it was not viewed as an integral requirement of the educational and training programme. This viewpoint is currently changing. Measures to assure and promote transfer are gradually being seen as components of education and training. Since transfer does not always occur without assisting circumstances, initiating transfer decisions and practicing steps to transfer must be integrated in training programs. Learning processes in the learning field (source) and the implementation and application processes in the function field (target) must be observed as one unit.

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Author:

Dr. Wolfgang Fichten
Carl von Ossietzky University of Oldenburg, Centre for Distance Education
D-26111 Oldenburg/Germany
forschungswerkstatt@uni-oldenburg.de

LEARNING COMMUNITIES IN AN ONLINE COURSE ON "PSYCHO-SOCIAL ASPECTS IN NURSING" - A COMMUNITY OF PRACTICE?

Wolfgang Fichten & Olaf Zawacki-Richter, Carl von Ossietzky University of Oldenburg

Abstract

This paper describes the pedagogical design of a non-credit online course for professionals in the field of healthcare. It is shown and discussed that participants establish a "virtual community of practitioners". The online learning environment and personal tutorial support facilitate the communicative and collaborative process of learning towards community building. Many authors in the field of e-learning or "distributed learning" (cf. Lea & Nicoll, 2002) apply the "community of practice" concept from Lave & Wenger (1991) to describe learning communities in online courses. However, the authors question if structured distance learning courses with a fixed curriculum or syllabus provide the space for "legitimate peripheral participation", which is essential for a community of practice in the sense of Lave & Wenger.

The Online Course

The online course for nurses is based on the study materials and experiences of the certificate programme on "Psycho-social Aspects in Nursing" developed and delivered by the Centre for Distance Education at Carl von Ossietzky University of Oldenburg (Bernath & Fichten, 1999). The study materials were also adapted in an extended German-American joint project on "The Healing Partnership - A New Model for Healthcare" (Waltos & Waltos, 2002). The objective of the course is important for political and pragmatic reasons in healthcare. It aims at developing the psycho-social competence of nurse practitioners and enabling them to impart suitable solution-centred strategies for promoting health among patients/clients.

The development of nursing towards an academic profession and its development into an "autonomous human services profession" (Keuchel, 2002, p.59) has led to completely new requirements and profiles, for which education and training has not yet been sufficiently prepared in Germany, so that there is a considerable demand among nurse practitioners for further training and professional development. In addition, nurses working in different sectors or institutions in the healthcare business frequently experience a discrepancy in their every-day working routine and the requirements and actual possibilities for their improved professional performance (Görres, 2002). This applies particularly for new tasks like health information and health advice. Psychological knowledge is necessary for appropriate interventions, because it has been found that psycho-social factors and processes are significant for actions concerning and promoting health (cf. Fichten, 1999).

Following the positive experiences with the implementation of the certificate programme in "Psycho-social Aspects in Nursing", in which distance study components are combined with face-to-face phases (Bernath, 2000), an online course was developed consisting of four modules, of which two modules were tested in 2001/2002 in an eight-week online seminar with a group of 32 nurses. The online course provides access and reduces the restrictions of face-to-face settings that do not comply with the organisational situations and circumstances of nurses such as work schedules, shift work, etc., as well as underlying private and social conditions or obligations. Distance education is therefore an appropriate mode of delivery for this target group (cf. Novotny, 2000).

The Online Learning Environment

The design of the online course is practically based on experiences with the Virtual Seminar for Professional Development in Distance Education (Bernath & Rubin, 1999) and its application in the Foundations of Distance Education course in the Master of Distance Education programme (Bernath & Rubin, 2003). Theoretically it is related to constructivist assumptions on the acquisition of knowledge. In the last few years various instructional approaches for designing learning environments have been developed on this basis "which should encourage an active exposition of problems and increase the application quality of knowledge " (Gerstenmaier & Mandl, 1995, p.875). According to Jonassen et al. (1995) constructivist learning environment should concentrate on four characteristics: context, construction, collaboration, conversation: "Constructivist environments engage learners in knowledge construction through collaborative activities that embed learning in a meaningful context and through reflection on what has been learned through conversation with other learners" (p. 13). Along the lines of these four characteristics the principles of constructivist learning environments can be described as follows:

Context: Learning is to be situated, i.e. embedded, in the material and social environment to which it refers (Clancey, 1997; Lave & Wenger, 1991). Learning tasks must be authentic and have a complexity that is realistic (Mandl, Gruber & Renkl, 1997). Subjects that are learnt in this way can be applied more easily and transferred to new, similar contexts. Learners are to observe and evaluate multiple contexts from different perspectives, a skill which is typical for advanced knowledge (cf. the "Cognitive Flexibility Theory" in accordance with Spiro & Jehng, 1990).

Construction: The construction of knowledge or meaning is an active process of articulation and reflection within a context. Articulation and reflection take place within the learners themselves (internal negotiation), whereby new knowledge is integrated with prior knowledge, as well as with other learners (external discussion) (cf. Jonassen et al., 1995, p.12).

Collaboration: Because learning is regarded as a social process, collaboration and cooperation play a central part. Learners must be encouraged to contest actively about contents. This is done in collaboration with others, for example, by a learner explaining his or her own understanding to other learners, and also by jointly discussing the procedure for solving a problem. Cooperation and articulation are the core elements of constructivist pedagogy (Duffy & Jonassen, 1992). Learning takes place in a so-called "knowledge building community" (Scardamalia & Bereiter, 1992).

Conversation: Mutual discourse, and not one-sided reception, is the focus of collaboration and cooperation (Johnson & Johnson, 1991; Slavin, 1995). Learners discuss their strategy for solving an authentic problem. The planning process contains phases of joint reflection, which can lead to changes to the problem strategy. The discussion is the basis of this process. In on-line learning it usually takes place via text-based computer conferences.

There are various examples for the realisation of these requirements in the field of e-learning, including in particular in the framework of training and further training for nursing personnel (cf. Naidu & Oliver, 1996, 1999; Naidu, Oliver & Koronios, 1999). However, fulfilling the principles referred to above requires considerable media development expenses (Mandl, Gruber & Renkl, 1997, p.176), which were not realisable for the Oldenburg online course. The course can therefore be used to show how a learning environment can be designed with an acceptable level of expense so that it corresponds as far as possible to the constructivist paradigm.

The success of online learning stands and falls "with the securing of the necessary information basis [...] and adaptive support for the group processes " (Reinmann-Rothmeier & Mandl, 2002, p.52). The print-based study material of the original programme course were revised and adapted to the requirements of an electronic learning environment. For example, a transparent structure, reduced amounts of text and practical cross-linking of text modules were all important. In addition, new text parts and documents were integrated, which correspond to the current state of discussions in this rapidly developing sector of health science. Particular value was placed on the communication of controversial positions (multi-perspectivity) and on presenting empirical data as well as examples of

authentic cases (authenticity) (cf. Reinmann-Rothmeier & Mandl, 2002), which were provided by nurses on previous courses and which were aimed at enabling problem-oriented learning (Renkl, 1996; cf. Hurst & Quinsee, 2003).

The Internet-based learning environment of the online course is Lotus Learning Space from IBM–software which is based on Lotus Notes. Lotus Notes is a so-called "groupware" for the computer-based collaboration of spatially dispersed groups (cf. Burke & Calabria, 1999). In spite of all the variety of software for Internet-based learning environments (cf. Baumgartner, Häfele & Maier-Häfele, 2002) they usually provide three types of tools that make up a virtual classroom: Information and presentation tools, communication tools and assessment tools (cf. Zawacki-Richter, 2004, forthcoming). An online course in Lotus Learning Space consists of three function areas: The "Schedule" guides users through the contents of the course. It contains introductions for each module with links to the appropriate study materials. The "Media Centre" contains the study materials, which can also be found with their own search terms (full-text search). Users can make their own notes for the individual documents. Communication on the module contents takes place in the "Course Room", which is also the location for group work. The "Profile" serves to strengthen the "online presence". Users can introduce themselves here with a photograph.

Situated, Collaborative Learning

In contrast to learning theories, which assume that knowledge exists independently of individuals and that the learning context has no effect on the acquisition of knowledge, new theoretical approaches from cognitive psychology postulate that learning processes cannot be separated from the concrete circumstances of the mediation and acquisition of knowledge. Learning processes are personally and socially situated (Mandl, Gruber & Renkl, 1997; Seel, 2001; Vosniadou, 1994). This view has also gained some significance for e-learning, whereby intensive discussions are taking place on the special characteristics (situative qualities) of electronic learning environments and their influences on the learning processes of participants in a virtual seminar.

One feature of virtual learning environments, and of the Oldenburg online course, is that participating students communicate with one another in the Course Room, analyse case examples together, work through assignments, etc., on the basis of their dealings with an information base (Media Centre). These reciprocal processes of exchange, which are created through media-enabled interactivity (Reinmann-Rothmeier & Mandl, 2002), result in a social contextualisation of the learning processes. As analyses of collaborative learning in online learning environments show, during the course of discussions learners jointly develop a largely corresponding reality construction, or mental models (Seel, 2001). The stocks of knowledge that each learner has are linked to one another and related to one another (knowledge integration: Carell, 2000). The learners participate in the process of cooperative knowledge construction (Reinmann-Rothmeier & Mandl, 2002; Bloh, 2002). Among the activities which play a part in the joint construction of a common knowledge base are the exchange of resources and information, attention to the contributions of other participants, feedback, etc. (McLoughlin & Luca, 2000). These collaborative activities start up and encourage higher-level mental processes, i.e. "the capacity to go beyond the information given, to adopt a critical stance, to evaluate, to have metacognitive awareness and problem solving capacities" (McLoughlin & Luca, 2000, p.2) (higher order learning: cf. Jonassen et al., 1995).

Socially distributed knowledge (shared knowledge, Reinmann-Rothmeier & Mandl, 2002) in the possession of learners is the basis of cooperative knowledge construction. It forms a common background for cooperative learning processes and provides a meaning for them¹. Rapid comprehension is possible, because the contributions of individuals to a discussion are located by the

¹ Based on the work of Gibbons et. al (1994), Peters (2003, p.142) notes that it is a general trend that knowledge is socially distributed. Degele (2002, p.11) calls this new kind of knowledge "informed knowledge". Peters (ibid.) analyses 17 characteristics of "informed knowledge" and concludes: "Knowledge in the computer age is [...] in a state of fundamental transformation, whereby not only its contents but also its functions and structure are changing. There are new stocks of knowledge and knowledge activities. This transformation is taking place at a practically incomprehensible speed so that we can already imagine the great effect this new knowledge will have in future on traditional knowledge and thought" (p. 144).

other participants in a network of shared knowledge and can be received without further explanations. The knowledge base of the individuals and of the group also has gaps, i.e. it is constantly being supplemented and developed in the course of communication in the virtual seminar (individual knowledge base: the stocks of knowledge brought in by others; collective knowledge base: through the information input of the stored documents and through the inputs of the course leader).

In the case of the Oldenburg online course this means: as healthcare specialists the participants bring stocks of knowledge with them, which are common to all (declarative and procedural knowledge, occupational model, ethical standards, etc.). The heterogeneity of the occupational field and the areas of activity has the effect that at the same time individual participants have special occupational knowledge, which is integrated into the online communication. The socially distributed knowledge guarantees the common basis for understanding, while the special occupational knowledge ensures in the course of cooperative knowledge construction the expansion and differentiation of the profession-related knowledge structure.

The quality and sophistication of the communication, which is ascertainable in the Oldenburg online course can be traced back to the following aspects:

- **Adaptability:** The course contents are practice-related. This makes it possible for participants to relate the information provided to their own experience and to argue from their respective experience horizons.
- **Complementarity:** The occupational embedding of the nursing personnel in various areas of the highly specialised health sector represents a favourable precondition for generating differentiated argumentation interdependences and practical experience.
- **Compatibility:** Because of the common professional background there is a potential for compatibilities, which enables mutual understanding and comprehension and a discussion of the individual contributions in a uniform learning and perception process.

Learning Communities, Knowledge Building Communities and Communities of Practice

The interactivity enabled by network-based learning environments is a pre-condition for collaborative learning and the cooperative construction of knowledge, which is associated with this. However, collaboration does not develop until the participants of an online seminar see themselves as a group and act as such. For this reason greater attention has been paid to the conditions for creation and the process sequences in virtual groups. The characteristics and qualities of virtual groups are discussed and the question is brought up as to why and under what conditions we can in any way speak of groups in network-based learning environments. Here, the model of the "communities of practice" comes in. The concept of "legitimate peripheral participation" is significant and central to situated learning in communities of practice favoured by Lave & Wenger (1991). This means: participation in practice is necessary for learning. Here learners must be permitted to take a peripheral part, at least temporarily, a position characterised by seclusion from the pressure to act. In order for learning to develop access to the practical field and the specific seclusion (peripherality) must be legitimised and accepted. If these characteristics are projected onto Internet-based learning environments and virtual learning groups it becomes clear that they certainly apply to defined types of mediated forms of interaction and communication (e.g. chat rooms or open forums). However, in the case of course programmes with a fixed curriculum and declared learning objectives peripherality becomes a critical factor. There are different degrees of participation in the joint discussion process (Carell, 2000). Passive participation can also certainly be tolerated² (legitimate peripherality), but the question remains regarding the effects passive participation has on the formation of a virtual group, on the process of cooperative knowledge construction, and what is the threshold value for passive

² As in traditional face-to-face seminars, online courses nearly always have participants who never take part in the computer conferences, or only as often as necessary. In the field of e-learning this behaviour is usually known as *lurking*. This does not necessarily mean that these participants learn less or poorly. In fact, it has been seen that they can achieve very good results. The term "witness-learner" (Fritsch, 1998) or "invisible student" (Beaudoin, 2003) appears to be more suitable because of the negative connotations of the term "lurk".

participants from which group coherence can no longer be referred to. Kirkup (2002) characterised communities as follows: "Communities [...] are seen as having strong reciprocity and members are actively engaged in the negotiation of meaning" (p. 187). In his opinion virtual learning communities have "only limited kinds of participation" (p. 194) available. Above all, if too many online learners do not participate actively in the joint construction of meaning and knowledge, a learning community (Reinmann-Rothmeier & Mandl, 2002; Carell, 2000; Kirkup, 2002; Thorpe, 2002) or a knowledge building community (Scardamalia & Bereiter, 1992) cannot be created.

How do participants in an online course become a virtual learning community? The question whether a community can come into existence in online learning, or whether and how a virtual group is formed, will be examined using our experiences with the Oldenburg online course. We differentiate first of all between structure and process. The structure includes the elements stipulated by instructional design in compliance with instructional principles for the design of constructivist learning environments, which provide a scaffold to support group formation. According to Jonassen et al. (1995), these include "worthy problems or questions of importance [...] tasks that are either replicas of or analogous to the kinds of real-world problems faced by [...] professionals in the field [...] problems requiring a repertoire of knowledge" (p. 12; cf. Mandl, Gruber & Renkl, 1997, p.171). These design principles also support motivation and promote transfer, and they encourage collaborative learning: "Complex and multidimensional tasks from authentic contexts [...] offer more (intrinsic) incentives for spontaneous collaboration processes" (Reinmann-Rothmeier & Mandl, 2002, p.48).

The participants of the online course were introduced at the beginning of each course to the study material which was to be worked through. In addition, specific learning objectives were listed and questions specified as suggestions for the joint discussion. Tasks were set as well, and sample solutions provided later. Along with the authentic cases contained in the documents, the participants brought case examples from their respective practical experience into the course of the discussions. The special advantages of the virtual seminar can be seen here: In a face-to-face seminar the focus is usually on one case from the practical experience of a single person (the course leader) and this is worked on, but in the online course all participants have an opportunity to present their cases and to discuss them with the others. The asynchronous communication allows the strategies for action and solution approaches, which have been discussed and developed jointly to be tested parallel in everyday practical work and the respective experiences to be fed back into the course, or feedback on the case to be obtained from other participants or from the course leader.

The process of group forming starts with the participants introducing themselves in the "Profiles" section. They report to the Course Room and are welcomed there. After the warm-up phase, and after they have familiarised themselves with the structures of the learning environment, a process which, like the discussion processes, is led and supported by the course leader, participants start the actual work of dealing with the contents of the information base (step 3), which leads to cooperative knowledge construction (step 4) and finally to the largely self-regulated further development of the knowledge building community (Jonassen et al., 1995; five-step model: cf. Salmon, 2000, p.26).

Groups are formed around tasks, which have to be worked on together. Coordination of the individual activities succeeds if the participants have a consistent conception of the problems set and the objectives. These have to be worked out and constructed jointly beforehand. Tasks are worked on in the context of internal group structures, which have to be designed in such a way that they encourage and promote collaboration and achieving objectives and results. A difference must therefore be made between a factual level and a relationships level.

On the factual level the asynchronous communications format provides a series of advantages. The participants of the online course were able to fall back on their own stocks of knowledge, relevant documents, additional literature, etc. to a much greater extent than in a face-to-face course. The following processes of cooperative knowledge construction (cf. Bloh, 2002, p.158) could be seen in the Oldenburg online course:

- Exchanges of opinions, information, concepts, ideas, etc.
- Concurring, rejecting or differentiating replies from other participants, illustrations, analogies, etc.
- Evaluating opinions, action strategies and solution approaches that were presented, pointing out alternatives, etc.
- Introducing additional cases, models, best practice examples, etc.
- Sharing resources by introducing additional documents (e.g. nursing models), bibliography, materials (questionnaires on medical histories and nursing documentation), etc.

In comparison with face-to-face settings, online learning environments lack social information stimuli and nonverbal signals, which serve to constitute and regulate internal relationship structures within the group. In our experience, however, this deficit is not as serious as it is often portrayed. Participants in an online seminar can also be "experienced", as individuals acquire a personal signature for each other in time. This is done via: introductions in the "Profiles" section; individual argumentation and discussion styles; the institutional establishment and job characteristics, which show through in the contributions to discussions.

A criterion for the "degree of maturity" of a group can be seen in the fact that, if problems with relationships occur, the group is able to clarify and cope with them itself. This was seen in the Oldenburg online course when some participants complained that some of the others were dominating and that their own contributions were being ignored. These conflicts were discussed and solved within the group without the course leader having to intervene.

On the whole, because of these indicators – collaborative development of knowledge in the framework of generated relationship structures – we can speak of a virtual community of practitioners. While it does not comply with the principle of peripherality (legitimate peripheral participation) emphasised by Lave & Wenger (1991) for Communities of Practice, which is based on the expectation of commitment, which results from collaboration. However, we can still refer to a "community of practitioners", because the participants belong to the same profession, have comparable occupational experiences and, at least as far as their basic training is concerned, have a largely concurrent stock of knowledge (homogeneity). This spectrum of common features, which creates opportunities for communication (cf. Carell, 2000), is overlaid and modified through special knowledge, which is acquired through occupational specialization and further training and moulded through different occupational environments/fields of activity, or in institutional situations, and contributed during the cooperative construction/integration of knowledge (heterogeneity). In this way, and through discussions with other members of the group, it becomes possible to develop new knowledge. The collaboratively generated knowledge base leads to an extension of the knowledge of all members of the virtual community of practitioners.

Conclusions

The online course is attractive above all because of the self-control and the autonomous, self-determined use of the teaching programmes. The precondition for a sound and intensive discussion is that the course contents are practice oriented and can be related to a participant's own occupational experiences. References to experience, problems and action are central criteria of problem-based occupation-related further training. Only then are opportunities opened for arguing on the basis of a participant's own experiences, for connecting imparted knowledge to practical situations, and also for being able to plan and realise concrete steps for change based on a widening of competence. These learning processes acquire a special quality in Internet-based learning environments through the opportunities existing there for an improved reflection in the common discourse.

The participants of the online course for nurses were able to link their personal experiences and practical knowledge with the contents of the course. The interactive and collaborative discourse in a "community of practitioners" supported the process of knowledge building. It is important that course members develop a sense of group identity, which leads to strong motivation and social commitment in order to contribute on a regular basis towards the construction of a common knowledge base. After

the end of the online course such a "community of practitioners" can be transformed into a Community of Practice in the sense of Lave & Wenger if the participants are interested in an ongoing discussion and exchange of ideas and experiences. We advocate for a two-step model in the context of structured online courses like the one described in this paper. It should be further investigated under which circumstances a "community of practitioners" can be developed towards a Community of Practice and what kind of learner support and guidance is needed to facilitate this process.

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Authors:

Dr. Wolfgang Fichten
Carl von Ossietzky University of Oldenburg, Centre for Distance Education
26111 Oldenburg/Germany
forschungswerkstatt@uni-oldenburg.de

Dr. Olaf Zawacki-Richter, MDE Faculty (Oldenburg University)
and Bankacademy e.V., efiport AG, Frankfurt/Main/Germany
zawacki@bankakademie.de

LEARNING ON DEMAND: DOES SELF-DIRECTED LEARNING HAVE A FUTURE OR IS IT A TRENDY ILLUSION?

Anke Grotlüschen, University of Hamburg

If one attaches any credence to current market thinking, expansive learning especially when it is Internet-based should be very much on the agenda. Virtual learning is described as being highly successful. Furthermore, it is assumed that telematic forms of learning are especially conducive to self-directed learning (cf. DYBOWSKI 2001, 13). On closer inspection, it is clear that learning efficiency gains may be achieved by the flexibilization that e-learning brings. So what the providers argue is that the central reason for the success of virtual learning is that it permits individual control over contents, place, and time of learning, which all adds up to self-direction in learning on no mean scale. 'Learning on demand' for adults is therefore to replace 'stockpiled learning' – as enabled by the New Media, first and foremost the Internet. Here we see just how close the equating of 'virtual' and 'self-directed' is in current practice. There are, as it happens, up-to-date study results available (GROTLÜSCHEN 2003), from which I would like to cite examples with specific reference to 'linear or hypertextual working through of online learning contents.' This qualitative study sought to take a closer look at virtual learning processes; also, to follow up the question whether virtual learning is the same as self-directed learning. Here only part of the results matrix can be illustrated, so I shall concentrate on the individual working through of learning software. But first it is necessary to sketch the study's didactic assumptions, for without knowing what they are, the results – being subjective patterns of reasoning – cannot be understood.

The current debate on learning construes the notion of 'self-directed learning' as either a currently necessary or a normative element, the implication being that self-directed learning is especially successful (DOHMEN 1999, 26 and is also susceptible to greater differentiation: GNAHS 1999, 246ff). Such promises require us to conceptually delineate what exactly is meant by self-directed learning. First, we must point to the active role the learner plays in the maneuvering and organization of the learning process (DOHMEN 1998, 64f). On the other hand, 'self-directed learning' can also be characterized in terms of the intended actions and content preferences of the learner. This refers to the latter's freedom to decide on learning contents and so transcends merely organizational aspects: "What we have is the interest-driven and active acquisition of the world by the actors concerned (FAULSTICH, ZEUNER 1999, 33). Such anchoring of the concept of self-directed learning uses a didactic fundament based on the category of 'expansive learning' as elaborated by Klaus HOLZKAMP (1993). Only so can a case be made for the superiority of self-directed as opposed to extraneously directed learning (cf. FAULSTICH, ZEUNER 1999, 30).

1. Rationales as the core of subject theory

Subject theory is a learning theory whose explanatory reach extends not just to the explication of cause-and-effect nexi, but also to the analysis of subjective reasons for action and the meanings of objects as ascribed by the learner. Holzkamp bases his description of the subject on perspectives and intentions (HOLZKAMP 1993, 21). We see that, according to Holzkamp, human decisions to act are not directed from the outside but emanate from the individual himself. Subject theory relates this idea of rationalized action to learning. Learning here is a special form of rational action, characterized by the fact that the primary course of action is not feasible as such and thus becomes the opportunity for learning. This foil is especially suited to empirically working through specific segments of learning (in this case virtual learning).

2. A Polarizing Effect: An empirical study of virtual learning

Let me start by pointedly anticipating the study's results, namely that e-learning seems to act as a *learning polarizer*, improving what is positive in the learning setup and aggravating what is negative.

This will be explicated in detail below. In line with theoretical requirements, the study presented here constitutes an analysis from the point of view of the learner. Its purview is the logical reconstruction of the contexts of action. The empirically uncovered patterns – in the generalized perspective of the subject formulated as a *rationale complex* – represent a contribution to explaining virtual learning (cf. GROTLÜSCHEN 2003). Accordingly, as-per-guideline interviews were conducted with participants at virtual learning courses. Interviewees participated as groups in telematic learning. The web-based training units (WBT) are of commercial provenance and are used by employed persons or job seekers. Each group is “online” for four to eight weeks, i.e. during this time they have access to WBT and receive guided tuition. The topics looked at here are “Internet for beginners” and “Applicant training interactive”. Interviews with altogether nine participants were supplemented by tutor interviews with the three persons concerned.

In essence, the survey in question shows just how unreflectedly virtual learning processes take place. Virtual e-learners give very little thought to the content they prefer. This is well exemplified by glancing at the category “Working through learning units”¹. Here two dimensions are under discussion, first the question whether the WBT should be worked through completely or incompletely, and secondly the question of the order in which the chapters should be worked on. Striking in this connection is the very large number of dropouts, which must be explicated in terms of the learning interests of the individuals in question. Surprising too is the complete boycotting of flexibilities in linear or hypertextual² procedures drawing on a variant-rich set of rationale matrices. However, all rationale matrices lead to the same result: learners proceed in a linear manner, with no exceptions.

2.1 Complete/incomplete working- through

Some of the interviewees³ broke off after only an incomplete working-through (T4, T7, T9, T10). It must be borne in mind, though, that the only persons prepared to be interviewed were those whose involvement with WBT was such that they now felt they had something to put on record. This means that the number of dropouts is higher than here indicated.

Of interest, however, are the explanations of those who managed to work through WBT to the very end. Both T2 and T5 were interested in installing e-learning in their company. They had explicitly worked through WBT for test purposes. T6, T9, and T10 would also like to base their professional career on e-learning and become active in further education – they too used WBT for test purposes. There are three persons here who have expressed an interest in the methodology of e-learning and whose readiness to work through the entire WBT is based on this methodological interest (T2, T5, T6). All three have a further interest in the contents. A joint interest in contents and methodology gives rise to a rationale sufficiently resilient to sustain working through the WBT in its entirety. T3 also worked through the WBT to the end. This person gives the contents as her background rationale, for she is hoping that professional advancement will follow from improved IT skills and deepened know-how. Furthermore, she defines herself as 'modern' over and against others working with traditional methods.

The rationales that have proved sufficiently resilient to sustain working through the WBT in its entirety may greatly vary, but certain structural similarities are discernible. Apart from the above indicated typical *coupling of interest in both contents and methods*, the *degree of premeditation* seems similarly wide-ranging: If we consider the interest in contents and/or methods, what stands out is that these persons (T2, T3, T5, T6, T8) were able to formulate their interest very comprehensively. The only dropout to likewise express her interest in a highly premeditated way was a woman who participated selectively in the WBT by working through the task to be submitted by mail. Two dropouts (T4, T7) were barely able to describe their interest in a comprehensive way. One other dropout (T10) was able to formulate his interest, but was not able to follow it up via the WBT. In sum, a *premeditated joint interest in method and contents* has proved to be sustainable.

¹ Similar rationale matrices can be found in other categories and at other systematic levels, but for reasons of space these cannot detain us here (cf. GROTLÜSCHEN 2003).

² In what follows, proceeding in a selective, non-linear way is referred to as 'hypertextual'.

³ Participant interviews are numbered from T2 to T10, the tutors from TUT1 to TUT3. Textual sequences are numbered by paragraph.

2.2 Linear working-through instead of learning on demand

One hyperstructure alone does not give us 'learning on demand'. Although the linked chapter arrangement facilitates the selective retrieval of individual topics, the interviewees preferred a linear approach to working through the contents. The interviewees find plastic descriptions for this, as the markings in the left column of the following table show.

T2: 50	<i>Well, I did that in chronological sequence, one after the other, from start to finish.</i>
T3: 107	<i>Well, most of the time I kept going straight on. I rarely found that I had to jump backwards.</i>
T3: 111	<i>Then, just as I already said, I went from chapter to chapter and got through the lot.</i>
T3: 113	<i>Well, that is just like when I'm reading: sometimes I am there in middle and then I'm there at the back and then there I am at the beginning. First of all you have to have a good look: where is there something interesting?. I always keep my eyes open. But when I am working, I start at the beginning and go straight through to the end.</i>
T3: 207	<i>And now you do this thing, then the other thing, and you do them properly.</i>
T4: 24	<i>So I guess I started at the beginning. And got about half way through it.</i>
T4: 31	<i>I thought to myself, what on earth is this? Until I latched on: You can start somewhere near the beginning and just work your way through to the end (...) The first thing I did was take a good close look at the text (laughs). But I found later I really didn't know anymore what had been talked about. So I just went to the beginning and I started to work through it from there on.</i>
T5: 77	<i>Always the top-down approach. From top to the bottom. I just went through the points, one by one.</i>
T5: 79	<i>From lesson one till all the way through.</i>
T6: 55	<i>Very classical the way I did it: from the beginning to the end.</i>
T6: 124	<i>Well, I also adopted the chronological approach, I practically went from the beginning to the end.</i>
T7: 82	<i>The way I went about it was also classical. I simply started at the beginning and went all the way through.</i>
T8: 93	<i>Chapter by chapter.</i>
T9: 66	<i>Yes, I just kept going forward. I read it through there, just skimming and the like.</i>
T10: 124	<i>From the very beginning, believe me.</i>

Table: Linear or hypertextual working-through?

From the beginning to the end, classical, chronological, chapter by chapter, from start to finish, top-down, from lesson one till all the way through, from the very beginning' – these were the terms used to characterize the activity of working-through and to distinguish it from other learning processes. First of all, there is no evidence for targeted selection; learners make the given structure their yardstick and stick to it. They start 'from the beginning' and keep going 'till they get through,' which gives them a certain illusion of completeness. The learning contents transmitted by the WBT seems to be terminated, so that it is subjectively rational to work through it from beginning to end. Furthermore, two employed interviewees describe a kind of 'working-through', which is more akin to systematically going through a pile of files than it is to learning activities involving deeper immersion in the contents. Finally, several interviewees refer to the inner arrangement of the WBT, namely the chapters or lessons. These indications point subliminally to the 'classical' way of proceeding, namely that some learners are aware of the text's hyperstructure and refuse to adopt a modern hypertextual way of proceeding. Occasionally 'jumping backwards' is almost seen as a failure.

All in all, working through the learning units can be characterized as an activity which is organized and structurally guided. This way of proceeding reminds one of school classes, in which a textbook is gone through lesson by lesson. Learning is understood here as a linear affair, as an orderly progression. Any impulses to search, setbacks, wrong turnings, openendednesses, and contradictions in the learning process clearly cannot be formulated and so remain concealed. *If learning can clearly be likened to an orderly process of working through of a task checklist, it is subjectively rational to proceed on the basis of the same linear working techniques.* The same holds for the point of view of the learning object. To the learner it must seem completely set out in the WBT – as *a learner I need only follow the depicted order in a rational way , then I will find out everything there is to be known here.* Typical sidetracking or the pausing to deepen one's grasp that accompanies each and every learning object are as concealed as are the wrong turnings to which human learning processes are prone. Both of these – the concealed process-related wrong turnings and the diversity of concealed content– are dimly discernible at best to the learner. *However, if it is the case (as it seems to be here) that learning proceeds in a linear way and contents are set out comprehensively, then it is subjectively rational to follow the prescribed path and to refrain from any deviations.*

The rationale for linearly working through the WBT is multifaceted. The interviewees assume – and in this are justified – a linear creation of learning units while succumbing to the illusion of completeness embedded therein. Moreover, the activity of clicking induces a general passivity, leading to a linear way of working through the material. Furthermore, the linear path corresponds to previous habits. In addition, the generally fragile state of interest and the relative lack of previous experience means that no criteria are available for selecting individual lessons. Then too, there is a underlying fear that something important will be overlooked by proceeding in a selective or hypertextual way. Furthermore, it is assumed that the learning units are set out in an author-specific manner, which supplies a reason for adopting a linear procedure, even in the event of comprehensive previous knowledge. But invariably underlying all these individual reasons is the lack of an action problematic — or, if there is one, then the imperfect way in which it is articulated. These diverse rationales are derived one by one below from the empirical material and translated into rationale matrices.

The interviewees give the *linear arrangement* of the learning units as their reason for adopting a linear way of proceeding (T3: 113). T3 has recognized how the lessons in the WBT 'Internet for beginners' are arranged, and thinks it makes sense to take over the same arrangement. Similarly, T6 gave the way the WBT 'Applicant's training' is arranged as his reason for proceeding as he did:

T6: 194 Well, I'd have to say I think it is because of the concept, because of the lessons, the way in which they are arranged. They are really well set out , that's why. Everything is built up so logically that you can depend on it being that way.

The orderly layout is put in a positive light by the interviewees. *Therefore the linear way of proceeding is subjectively rational for learners on grounds of how the contents of the WBT are arranged.* Furthermore, it is seen as necessary that the learning contents should be so arranged and worked through in that order – the stringent nature of the arrangement is at no time perceived as a hindrance or disruption. (T2: 50). Thus the fact that the learning contents have been virtually processed gives it the character of an instruction manual, with learners being admonished to follow the order of the lessons. T7 explicitly makes the comparison:

T7: 82 I think it makes sense for me, as with any instruction manual, just to start at the beginning.

To this guideline – that later lessons shall build on earlier ones – learners rationally adapt . As soon as they depart therefrom, whether by accident or design, they run into trouble. Either the subsequent lessons can no longer be understood (T4: 31) or the exercises for the later lessons prove too difficult to solve (T9: 47 on the exercise 'Application letters and curricula'). Here a hypertextual way of proceeding has been impeded by the arrangement of the lessons: T9 did not want to work through the WBT in its entirety owing to her comprehensive previous experience, but she did want to benefit from the exercise and to receive feedback from the tutor. She describes this as difficult (notwithstanding,

she successfully coped with it). The tutors⁴ confirmed that both surveyed WBT have a linear arrangement (TUT1: 92, TUT2: 86, TUT3: 76).

Even if the linear arrangement of both WBT was clearly recognized by the interviewees and cited as a reason for proceeding linearly, an explanatory deficit still remains, for all interviewees had prior knowledge of the contents on offer. So it was not necessary to rehearse by WBT what was already known, particularly bearing in mind that learning in the group of employees took place under strong time constraints. Why then did they persist in working through the contents in linear fashion? To answer this we need to canvas other factors, such as account for small and smallest manifestations of the lack of a learning problem: as long as no subjectively premeditated, articulated learning task is set to guide one through the learning lineup, there will be reasons favoring a linear working-through, chief of which is *passivity*: The interviewees mostly describe what they do with the WBT as working through it. However, in rarer moments they talk more vividly of clicking:

T7: 30 And the general idea I got went like this: Just click anywhere.

Now, T7 is annoyed anyway because of massive technical problems, so this statement has to be relativized a bit. But the same phenomenon is alluded to by T5, who explains in the context how easily the course of the WBT took place:

T5: 143 It went like this: when something came, you clicked.

What is striking in these two statements is the direct nexus between clicking and direction by others. Working with the WBT is simple to the point of banality, it is prescribed in advance down to the smallest detail and requires only one thing from the learner: clicking. Certainly clicking alone does not determine the depth of engagement with the contents – but it does have a mechanical and monotonous character, one that is profoundly directed by others. This reinforces the learner's rationale in a defensive direction: *If such a simple path has been set up just for me to learn, it is only reasonable that I should follow it – and refrain from more demanding learning activities.* This structure is also based on internalizations and *habits*. For example: self-definitions are possible that that are straightforward to an extent:

T9: 66 But that's also because I am just that sort of person, someone who likes to go through from beginning to end.

In a further conversation, T9 refers to two central influences that pursue her when she is learning: school experiences and books (T9: 68). She is the only one to explicitly refer to these habits, though this was somewhat prompted by the interview context.⁵ The change from a linear structure to a hypertext-structure has therefore only been completed on the web so far, not in learners' activity patterns. *If the previous linear tactics was successful, the rational thing to do will be to stick with it. Only in the event that linear tactics fail, for example if I cannot cope with it in my current situation to work through the whole WBT, will it be subjectively rational to change tactics and select those areas for learning, which promise to yield solutions to my most important questions.* Now how do things look with regard to *selecting* these important areas? Here too the interviewees had little to say on this, as they indeed had not made any selection. T9 speculates as follows:

T9: 68 Maybe sometimes it's just like I don't know exactly what matters most for me.

A typical pattern of reasoning is shown here, such as is always encountered when the learning object is still very strange to the learner. Only with an increasing overview of the object does it become possible to pursue the subjectively interesting segments and to omit others. *As long as the whole field is unclear to me, it will be rational for me to obtain my overview from the chapter structure of the WBT.* Besides a linear arrangement, passivity, habits and missing selection criteria, a subtler reason for

⁴ Furthermore, the tutor of the internet course reports being herself inclined to build topics in a linear way (TUT1: 100).

⁵ I regularly inserted into follow-up interviews questions that had arisen in the first interviews. By the eighth interview at the latest, it had become clear that all interviewees had proceeded in a linear way. I therefore dedicated more time to getting T9 and T10 to state their reasons.

the linearity running through the learning units is indicated in two interviews. It is the learner's concern at possibly missing out on something *important*. Fascinatingly, it is particularly the method of e-learning which deters T2 from proceeding according to his interest and in a selective-hypertextual mode. He rejects such a way of proceeding:

T2: 68 But to go here right away and say: Well, that interests me, that wouldn't have been the way I went about it. Especially for the first time in such a course.

The point of being in the course for the first time – for test purposes – is for him to gain an impression of WBT that is as comprehensive as possible, so it is rational for him to proceed in a linear way. He assumes that by so proceeding he will come to know everything in terms of contents and method that is to be known in the WBT. Also, the tutor of the applicant's group (TUT2:88) points to inexperience as a reason for preferring a linear working-through. T9 too formulates her concern at overlooking something important (T9: 68). She refers her concern – at missing something – to the contents and the cumulative way in which they are structured – thus seen, it is rational to proceed in a linear manner. This is not only because of the linear way in which the WBT is arranged. T9 describes her concern, however, by referring to a specialist work, in which the authors recommend a selective hypertextual way of reading – but she does not follow this proposal either. She mistrusts the recommendation, although the book is not structured cumulatively and therefore, according to the authors, can be read in a hypertextual way, i.e. although no danger of missing out on something important exists. Also, the comprehensive previous knowledge of the contents, to which all the interviewees are privy, suggests that fear of overlooking something important cannot solely be blamed on the linear way in which the contents are arranged.

3. Escalation: lack of forethought

In summarizing the empirical results, it is of note that we have to do with diffuse and unpremeditated interests, these running parallel in the linear passive working structures, and involving problems of forgetting/retaining as well as various insecurities in interaction (e.g. fear of evaluation) (cf. GROTLÜSCHEN 2003). The parallelism consists in a repeated lack of premeditation in respect of one's interests. In situations where expansive learning, for example, requires selective decisions as to the contents, insecurity has to be abandoned, difficulties have to be overcome, and/or the right not to be directed by others has to be fought for – the learners fall back into defensive learning stances that are subjectively rationalized. One needs only look closer at the individual results to grasp the rationale and gain a sense of what it involves. Learners find themselves caught in a web of habitual, insinuated, and/or acutely manifested directions from others. They encounter prestructured contents sorted into lessons; seemingly clearcut underwriting of results by means of tests; interaction structures and feedback dominated by tutors; other-directed priorities in respect of time and method; spatial restrictions defined by the material; a non transparent technique and a learning setup clarified in advance with little or no presence. Here defensive learning is justified in a great diversity of ways.

The typical rationale matrix that leads to one's own learning interests being rejected is, at best, still recognizable as: *My thematic interests obviously have no place here, that is why it is rational for me not to pursue them.* More subtly insinuating, however, is the omnipresent expectation of encountering other-directed learning. This gives rise to a syndrome that right from the outset prevents any reflecting on thematic interests: *If when learning, or indeed doing anything, everything is decided over my head, it is not rational for me to have time for thematic interests and contexts of action.* At the same time, learners always encounter, in real life, decisions being taken by superiors, tutors, authors, and educational planners which go to confirm this assumption. Escalating the insight, we can therefore say that learners have good reason to refrain from investing forethought in learning problems.

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Author:

Dr. Anke Grotluschen
Universität Hamburg, Fachbereich Erziehungswissenschaft
Institut für Sozialpädagogik, Erwachsenenbildung und
Freizeitforschung
Joseph-Carlebach-Platz 1 (Binderstrasse 34), 20146 Hamburg
grotlueschen@erzwiss.uni-hamburg.de / anke.grotlueschen@gmx.de

CREATING LEARNER-CENTRED STUDY MATERIALS - THE EUROPEAN ENHANCEMENT OF EARLY YEARS MANAGEMENT SKILLS PROJECT

Petra Luck, Liverpool Hope University

Introduction

The Leonardo funded 'European Enhancement of Early Years Management Skills' (EEEYMS) is being promoted and co-ordinated by Liverpool Hope University College, UK. Liverpool Hope University College has a 150-year tradition of widening participation and has over the last decade expanded degree provision to a number of Network of Hope locations across the Northwest of England to further provide access to those groups of students currently still underrepresented in Higher Education in the UK. In response to needs expressed by national and local employers, vocational training providers and other key players in Early Years Education and Care, Liverpool Hope's Management and Business Centre established a BA Nursery Management in 2001. To date this degree remains the only one of its kind in the UK providing a higher-level management qualification in a rapidly expanding Service sector. This degree has since the academic year 2002/3 been available as an e-learning degree for a pilot cohort in the UK.

This paper outlines the background to the EEEYMS project, explores the aims of the project, analyses the student support mechanisms and issues that have emerged from the e-learning BA Nursery Management programme at Liverpool Hope and how these issues will impact on providing learner support within the EEEYMS project. Lastly, the paper will explore how the dissemination strategies employed by the EEEYMS project can inform about the core issues of developing learner centred study materials for an emergent service industry as well as disseminating good practice regarding learner support.

Background to the Project

Liverpool Hope set up a consortium of European partners comprising the National Day Nurseries Association (NDNA, UK), the Professional Association of Nursery Nurses (PANN, UK), the Public sector Trade Union (KTV, Finland), Virtual Technologies Ltd (VirTech, Bulgaria) and Bulgarian Telework Association (BgTA) to develop a European framework for a Management qualification in the Early Years. The funding bid to Leonardo has been successful and the 3-year project commenced in October 2003. The partnership for the project very early on recognised the opportunities of using on-line learning as a means to reach the target audience.

The need for such a higher-level Management qualification is well documented. In the UK, for instance, the private sector for nursery provision has grown by 400% over the last 10 years; yet it still only meets 2% of the current demand. As a result the UK government has set targets to recruit 83000 child carers by 2003. Further, the government is committed to spending £200 million to provide 1.6 million childcare places by 2004; the current provision is 600,000 at a cost of £66 million. Clearly this is a large increase and will require a considerable amount of training provision. The OECD publication "Starting Strong - Early Childhood Education and Care"(ECEC), 2001, shows the developments and trends in other European countries. In Finland, 12% of 1-3 year olds now attend family day care centres with another 12% in childcare centres. 54% of the 3-6-age range attends centres on a full time basis and a further 12% on a part time basis. It is similar in France, Norway, Netherlands and Belgium, and is significantly higher in Italy. Significant child carer recruitment targets have been set in all European countries and this will require a considerable amount of training provision, much of which will need to be distance leaning orientated. Due to the nature of this employment sector it is evident from OECD research that the current provision for training and development of child care staff is only

of a pedagogic or vocational nature, with no specific training and development opportunities in child care management. They are however expected to perform these management roles. "In countries with complex funding streams, staff are expected to be social entrepreneurs to juggle various funding sources, compete for scarce resources and grants" (OECD 2001). This research further shows the need for ODL training. "Workers face many practical challenges to access in-service training, especially the difficulty of obtaining release time with pay to attend courses". In addition to the training and management skills development there are the issues of equal opportunities to address. According to Owen et al (1998) Nursery Nurses in the UK are 99.2% female with only 1% educated to degree level. The EC Childcare network proposed a target of 20% male workers to be reached over the next 10 years (EC Childcare Network 1996). It has to be noted that compared to their female colleagues, men in female dominated occupations more frequently hold supervisory positions and therefore also have higher salaries, according to Finnish researchers Kauppinen-Toropainen and Lammi (1993). In the UK, the DayCare Trust emphasises the need for senior childcare workers to be at graduate level (Rolfe et al, 2003). OECD research highlights the issues of recruitment and retention, gender, diversity, pay, training, quality and professionalism across Europe. Further research is needed in these areas and a far greater co-operation between European countries, in order to provide some resolution to these issues. However, some of the key barriers to raising professionalism are the lack of a recognised Europe wide qualification and the difficulties for many Early Years practitioners to access traditional, college based training and education while working. Learner support for workplace training is not uniformly available to many staff working as part of a low pay service industry.

Therefore the EEEYMS partnership recognised that the development of customised Web and CD ROM based materials to deliver a European qualification provide opportunities to supporting the learner through content and course design by creating learner-centred study materials. Students can be encouraged to develop independent learning skills and assessment strategies can integrate work based learning and Accreditation of Prior Learning and Experience (APEL).

Aims of the Project

The project is aimed at the Early Years Childcare/Nursery Nurse vocational group. It is specifically intended to enhance employability of people employed in this sector by providing access to a high level qualification in line with the emerging industry requirements. This is to be achieved by developing distance learning materials available via the World Wide Web and other forms of delivery media including CD ROM, specific to the employment area which is also aligned to a degree pathway, and will be available within Europe. Further, it is intended to create a European network association for childcare to support the co-ordination of this project and to ensure its continuance after the project is complete.

The project will provide an accredited route for the attainment of a relevant degree level qualification for carers and managers within the childcare sector, and assist in attracting suitable people into this employment sector to meet the childcare demand over the next 10 years. It will provide a vehicle which enhances the skills in management which are now needed in this expanding sector and prepare candidates to meet the demands of future employment.

In promoting the use of web based multi media delivery the project aims to encourage learners as active participants both in the design stage of ODL materials and as participants in the pilot and evaluation stages. Honey (2001) identifies that 'learning has always flourished when it has been actively encouraged and supported'. The learning and assessment on the programme will be aligned (Biggs, 1999) to learners everyday work experiences. This type of social interaction, learning and decision making is expected in the workplace today and this approach should ultimately therefore promote a desire for and ability to partake in 'life long learning'.

The project will embrace the use of computer technology and communication systems by critical use of the World Wide Web and interactive CD Rom multi-media. This allows the broadening of access to the target group, as delivery will be achieved while candidates continue to be active within the

workplace. This will enhance the learning experience and the employability factors, as the knowledge will be directly transferable to the work environment.

The requirements of the expanding employment area will be met by the development of high quality interactive training materials, which are geared to the achievement of competencies directly related to the target group.

Lessons from Liverpool Hope's e-learning BA Nursery Management programme

Following on from the initial success of the taught BA Nursery Management programme, in 2002/3 the team at Liverpool Hope decided to make the programme available to interested applicants from the UK via e-learning. This pilot is being researched extensively and some of the key learning experiences are envisaged to impact directly on the curriculum design of ODL materials and e-learning pedagogy employed in the EEEYMS project.

Issues emerging from the ongoing research and development of the e-learning route at Liverpool Hope are: the importance of the use of a suitable VLE in delivering the learning, the use of Problem Based Learning (PBL) to enhance student motivation through collaboration, the need of IT skills development and the role of context as it relates to student success.

In deciding on an e-Learning mode the team was aware that e-learning can be misunderstood as an 'information dump' and not as a process. This is in response to Honey's assertion that "The common thread running through ...forms of e-learning is that they offer the possibility of learning from information delivered to us electronically". (2001, p.200). Honey furthermore asserts that "E-learning more often than not amounts to e-reading" (2001, p.202).

Liverpool Hope's chosen virtual learning environment is Granada's 'Learnwise'. This VLE has as one of its features collaborative 'Forums' in which students take part in asynchronous discussion in small teams and work on specific management and education problems. The team decided that these forums would provide a prime vehicle for student support through 'encouraging active learning', shifting from didactic to facilitative teaching' or 'building online communities' (Armitage, Brown *et al*, 2001)

The stated aim of the BA programme is that students will develop a knowledge and understanding of the educational and management issues pertinent to their sector, and that they will also develop the requisite skills to critically analyse, evaluate and apply this knowledge. As professional knowledge requires functioning knowledge that can be put to work immediately the management team choose to adopt a 'Problem Based Learning' approach for the programme

Problem based learning simulates everyday learning and problem solving. Knowledge is acquired in a working context and is put back to use in that context. Students learn the skills for seeking out the required knowledge when the occasion arises. They are motivated immediately by the interaction with a 'real' problem and are active early in the process. There is a large body of literature to support the motivational aspects of collaboration on learning (Johnson and Johnson, 1989; Sharan and Shaulov, 1990; Dobos, 1996). Students are assigned to small problem solving groups and begin cooperating with tutors and peers, to build up a knowledge base of material; they learn where to go and check it and seek out more. They are guided to a wide variety of resources. Knowledge is developed, strengthened and applied.

Using a Problem based learning approach has been seen to be particularly important as these students are working at a distance and it is anticipated that the students will maintain their sense of belonging to the group and the programme by working together on shared problems. In so doing their skills of communication, self-direction and team working, problem solving and creativity will be developed.

While Donohue (2002) asserts that the childcare field tends to be a low tech/high touch field, distance learning and particularly on-line learning can be perceived as a high tech/no touch activity. Staff employed in the Early Years sector often have limited experience with technology and might lack technological literacy. This demands opportunities for students for hands-on technology experiences and

skills development such as provided in the Induction Residential for the BA Nursery Management. Students built on this induction during their first modules and comment on skills enhancement:

“I have learnt loads and have really enjoyed the challenge of beating the internet in my quest for information on French education amongst other things.”

“I had a fair bit of IT training and experience – but had not done much research on the web! Boy what info you can find. I certainly became addicted. Problem I think though – is when do you decide you have enough info”

The team attempted to make the technology as transparent as possible by giving technical as well as academic support so that students can focus on the content, not worry about fighting the technology to access information and communicate with each other. Students’ skills development is apparent in these quotes from reflective evaluations:

“I had also never entered chat rooms or even sent attachments with my emails yet suddenly I’m like a computer wiz kid (well perhaps not!)”

The context of the common professional field also provided a strong element of learner support and motivation to remain an active participant in the learning. Context has given the rich backdrop and focus in which the student can learn. Context enhances not only the student’s academic studies, but also their everyday practical knowledge and acquisition of skills, which can be used in their everyday employment. This is apparent from the following student comment:

“I am constantly using the information gained in my setting and have been able to download a good deal for the presentation I am giving to about 50 of my parents on Thursday in line with my Partners as parents policy which has made my life very easy. Looking forward to starting back again and having looked at the problems feel that this will once again help me in my day to day working”

Student Support issues pertinent to the EEEYMS Project

In the initial phases of the EEEYMS project research has focussed on the existing provision of Early Years Management qualifications in Europe. This has revealed that the provision of qualification is diverse, covering a range of vocational, Further Education and Higher Education offerings located within education, social welfare and social care perspectives reflecting the diverse philosophical background of Educare provision within Europe. To date no online or e-learning programme appears to have been developed with a specific focus on Management in the Early Years.

Research into pedagogical approaches into ODL material development is ongoing involving particularly the Bulgarian Partners and Learning and Teaching staff at Hope. The partners in the project concerned with the development of the ODL materials have a breadth of experience in using VLE’s, producing CD ROMS and using PBL online. It will be a challenge to produce materials encompassing this richness of experience. However, the tension in current discussions about pedagogy among the partners is proving creative and focussed on the learner experience.

This debate will be informed by current research through a questionnaire aimed at potential students of EEEYMS designed materials. Questionnaires are currently being distributed to Early Years practitioners in a number of European countries and this research is being co-ordinated by the External Evaluator to the project from the University of Bremen. Focus of this first questionnaire is on IT accessibility, existing IT skills and confidence and technical requirements of future participants. Outcomes of this research phase will influence the design of pilot materials.

An evaluation report of the feasibility of delivery and ODL issues will inform an amended design and delivery methodology prior to embarking on the full development of the materials across the programme. This evaluation will include consultation with suitable professional bodies and childcare organisations across Europe and qualitative research into the experiences and perceptions of learners participating in the pilot modules.

Given the Liverpool Hope experiences of e-learning for Early Years managers and the importance of a common professional context for motivating students, it will be a challenge to embed or replicate this in EEEYMS materials given the diverse professional backgrounds and historical perspectives of Early Years in various European Countries.

Disadvantaged groups in the Labour Market as learners-challenges for student support

Through the development of a higher-level Degree qualification, particularly in terms of ODL materials, the project will enhance employment opportunities and career status for a still predominantly female workforce. Research suggests that the increased status and professionalisation obtained through the availability of a high level qualification will make the industry more attractive to male employees. The use of ODL materials will also enhance accessibility to training for people with disabilities, as the distance-learning mode will provide widening participation opportunities. Accepted standards will be applied to the development of content for distribution through the ODL materials, particularly the Virtual Learning Environments used to ensure it is accessible. Users will be able to configure ODL materials to make use of an associated text-reader allowing even visually impaired students to access the content. Furthermore, users will be able use the accessibility tools of Internet Explorer to specify font sizes, styles and colours or apply their own style sheets to web-based content.

The use of computer technology and communication systems through use of a Virtual Learning Environment and critical use of the World Wide Web allows the broadening of access to the target group, as delivery will be achieved while students continue to be active within the workplace. This will enhance the learning experience and the employability factors, as the knowledge will be directly transferable to the work environment. In such a way the project aims to provide access to a higher level qualification to people disadvantaged in the labour market and those who face discrimination in accessing training due to disability, geographical location or family commitments.

Dissemination Strategies

The EEEYMS project will be developed using six concepts: - organisation of information, information processing, presentation, collaborate and communicate, review and reflect, plan and produce. This will provide a structured route providing feedback at each stage of development.

In addition, an external, independent evaluator will be contracted to provide objective feedback on the programme, covering all aspects of the development work. It is envisaged that this is an integral part of the review process that will follow a normal control cycle. An independent evaluator has been identified in Germany, the Digital Media in Education Research Centre of the University of Bremen. This centre has a strong background in evaluation and monitoring of National and International projects and a particular expertise with regards to gender mainstreaming.

Among the project partners, the NDNA is well placed to strongly assist with the aspects of equal access having strong links with Early Years Development Childcare Partnerships that are particularly focused on the recruitment of practitioners from under represented groups. Again there are European links through these associations in the Early Years field. The NDNA will through their already well-established network, take the lead role in the process of dissemination through the organisation of conferences, both formative and summative.

PANN and KTV will also be able to contribute in this area in a similar way. As the representative bodies of practitioners both organisations are uniquely placed to link immediately with the learners /practitioners in the UK and Finland as well as providing opportunities to 'tap into' learner needs in a range of other European countries through Trade Unions in those countries. However, dissemination will be the responsibility of all partners to ensure that this is undertaken on a local, regional, national and international level while Liverpool Hope will take overall responsibility for dissemination.

It is essential that the focus of dissemination of the project must be on the learner experience. The EEEYMS project is responding to identified national/European needs and governments strategies in a

social and economic context. It is therefore timely, relevant and unique in promoting the use of the most modern delivery methods and advancing the use of Information Technology while widening participation.

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Author

Petra Luck
Liverpool Hope University College
Hope Park
Liverpool, L16 9JD
United Kingdom
luckp@hope.ac.uk

ON-LINE COMMUNICATION, INTERACTION AND LEARNING CONFIDENCE: SUPPORTING HEALTH AND SOCIAL CARE PROFESSIONALS STUDYING PART-TIME

Jane Morgan, University of Southampton

Abstract

This paper discusses on-line communication and interaction between teachers and learners and draws on the findings from a study that explored in what ways on-line communication and interaction with teachers influence the learning confidence of learners studying part-time at a distance [1]. The findings, discussed in greater detail in this paper, indicate that by the end of the programme, all of the learners gained, to varying degrees, increased confidence to learn. The personal and interpersonal features of teaching and learning and the possibilities for social presence in a non-contiguous, technologically mediated learning environment are identified as central to the support learners need to develop learning confidence.

The findings identify a number of key contributors to learning confidence and characteristics associated with learning confidence that have implications for the way learner support is structured. The broader implications for supporting learners, drawn from the findings of the study, will be discussed along with recommendations for further research.

Introduction

This paper discusses on-line communication and interaction between teachers and learners who are qualified Health and Social Care Professionals working full-time and studying part-time. The study followed a naturalistic approach combining illuminative evaluation and case study, involving eighteen learners all of whom were women. It was carried out over a period of eighteen months during which time learners completed the third year of the BSc (Hons) Health Studies programme.

Findings suggest that the learner and teacher relationship is a key contributing factor to increasing learning confidence. As a result of breaking down traditional barriers, a shared understanding of each other's role and realistic expectations of each other's role developed and a close, interdependent, partnership style relationship served as the scaffolding for learner support. The learner and teacher relationship was placed at the centre of the framework for learner support that developed from this study.

Background

Increased emphasis on flexible, student-centred learning as part of mainstream higher education has influenced the general context of learning in Higher Education globally over the last two decades [2,3,4]. At the centre of the changes to the processes of education is a shift in educational mission from providing instruction to providing learning using constructive rather than objective knowledge. This approach to learning focuses on what learners need to learn rather than what teachers need to do, learner outcomes, productivity and learning styles. A key aspect of education is that of communication, linked to a range of communicative transactions that focus on electronic information systems for information transmission, storage and processing. The move away from classroom based learning to a more diverse learning environment characterised by a Managed Learning Environment (MLE) provide interoperable systems that enable access to comprehensive information, teachers and other learners, anytime, anywhere. All of which imply not only changes to the communicative transactions used for learning but also significant shifts to the role of the teacher and learner that include changes to the nature of support needed by learners.

The support of learners to achieve success in such a diverse learning environment is central to the UK Government's objectives for Higher Education and is identified as one of the most important aspects

of good practice for UK Higher Education Institutions (Universities UK report on Student Services (Nov 2002) and the Achieving Student Success paper (March 2002). Success is measured in terms of wider participation, improved retention and achievement rates and enhanced employability that in turn support the concept of lifelong learning.

Calls for the development of a culture of life-long learning in the National Health Service and pledges to use technology for learning are likely to make on-line communication and interaction between students and teachers the dominant means by which learning is organised for Health and Social Care Professionals in the future [5,6,7]. The learners in this study, as Health and Social Care Professionals employed by The National Health Service of the United Kingdom (NHS, UK) are required by their professional organisations to maintain a Continuous Professional Development (CPD) portfolio and so face the challenge of learning as adults, in new ways, in new learning environments and with new roles.

Responsibility for learning, in terms of time and place is increasingly transferred to the individual and while it may contribute to increased managerial efficiency and effectiveness in the NHS [8], there is a strong possibility for extra demands and additional stress to be placed on learners when as full time professionals they take on the added burden of part-time study [9]. Learning confidence is seen as central to the range of transferable skills necessary for lifelong learning, particularly resource literacy and information technology skills [10, 11, 12, 13]. For these reasons, employers could see benefits in distance learning. Many students, having achieved an academic diploma alongside their professional qualification, recognised the need to continue study and during the first three to four years of their career they were marrying, starting a family, changing jobs and moving home. Distance learning provides the flexibility they needed to study when and where they wanted.

The teachers responsible for planning the BSc(Hons) Health Studies Programme faced the challenge of supporting learners to learn in new ways, in a new learning environment. The communication and interaction process for the distance learning programme used a basic technological structure consisting of e-mail, an electronic chat room and the telephone. At the time when the study took place, a virtual learning environment was still under development. The Institute had set up a distance learning unit with a distance learning manager providing academic support for those teachers implementing distance learning and an extensive administration service including a telephone 'help desk' system for students. This provided a valuable infrastructure of support for the delivery of the programme but didn't answer the question how best to structure the student and teacher interaction required in relation to learning support?

Planning support for learners

How students could best be supported to manage the various communicative transactions was recognised as vital to the success of the programme. The programme planning team re-considered the meaning of support for learning at a distance and more specifically, how teaching and learning might be facilitated through online communication and interaction. It was essential to consider the difference between communication and interaction. Gunawardena et al, differentiate between communication and interaction defining interaction as 'the totality of interconnected and mutually responsive messages' [14]. Interactivity represents a holistic view of the communicative context and is seen as a quality potential that may be realised by some or remain unfulfilled by others. Viewed in this way the communicative whole (interaction) might well be greater than the sum of the individual exchanges (communication). Essentially, it is possible to communicate without interacting but it is not possible to interact without communicating.

The idea of communication and interaction, in the absence of face-to-face contact has developed considerably over the past two decades [15, 16]. A central message throughout its development is that it provides examples of positive learning support experiences using adaptive media to provide feedback to students but that opportunities are dependent on a change in the role of the teacher and learner [17, 18]. The idea that personal communication and interaction, as an aspect of personal relations between students and teachers, can be fostered by a form of 'simulated communication', was presented by Holmberg in 1996. Important characteristics for success were identified as the development of empathy between student and teacher and emotional involvement of the student by for example, ensuring a conversational manner of writing that addresses the student as an individual.

Holmberg presented his ideas as the concept of simulated didactic conversation, characterised by less control, less authoritarian intervention and aimed at transformation and the facilitation of growth [19]. Students are seen as partners with knowledge, experience and capacity with which to contribute to a simulated on-line conversation aimed at promoting learning and the development of new insights. Such terms as ‘guide’ and ‘mentor’ are used to illustrate the changed role for the teacher [20].

Teachers were comfortable with a less authoritarian approach and their aims matched those of the role of a facilitator. However, concerns about dependent style student behaviours in traditional classroom learning and teaching created a high degree of uncertainty for teachers about how on-line communication would work and whether interaction was possible at all in this context. It became apparent, when planning the programme, that there were different expectations between teachers and students about whose responsibility it was to communicate to whom and when. All of the teachers had experienced difficulty with students who leave their study to the last minute prior to submission of an assignment, make unrealistic requests for learning support and demonstrate poor skills in planning and managing learning. In an attempt to address these issues in advance, a new framework for learner support was designed. The framework for learner support in this case was designed to assist learners to take greater control of their own learning and develop skills in managing their own learning.

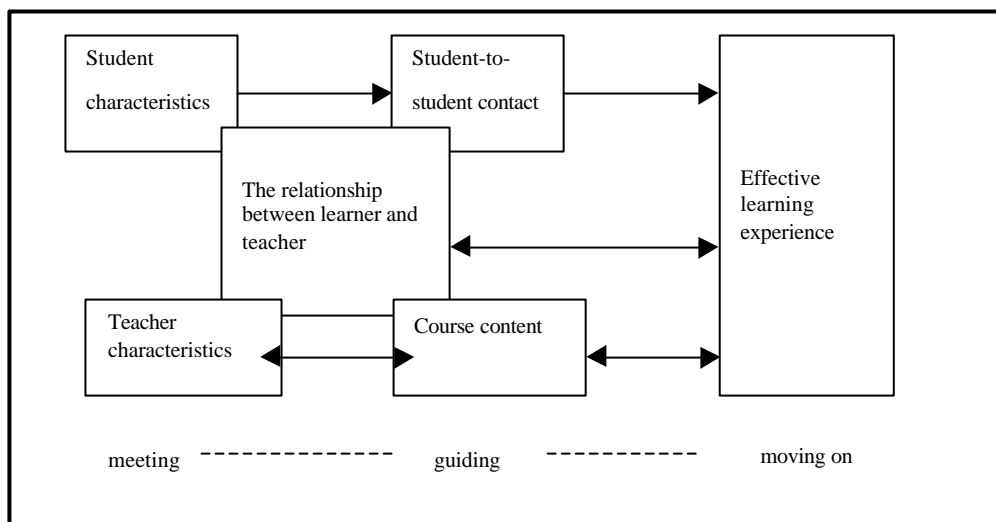
A framework for supporting learning at a distance

A learning support framework was developed as a result of the study based on a model of Supportive Learning (21) Fig 1 below. This model places the relationship between learner and teacher as the central pin upon which four additional variables rotate and interrelate. This matched closely with the programme planners’ aims that the learner and teacher relationship would act as the scaffolding for the communication and interaction process.

The framework identified the focus of support as promoting characteristics associated with lifelong learning. It was designed to provide teachers with a clear guide to the range of opportunities to be made available to learners around a time schedule using different media. Characteristic associated with lifelong learning include for example, to actively construct their own knowledge, manage their own learning, develop an understanding of how to learn and develop the skills of analysis, problem solving, adaptation, synthesis and evaluation. Value was placed on the learner and teacher relationship with a view that learners are partners in the learning process. The framework was designed to identify for learners, their entitlements. It aimed to provide greater clarity on the responsibilities of both parties for communicating and interacting. The framework considered local provision of support and was designed to be used for this one programme and to be included in and complement central provision of support organised by the Distance Learning Unit.

A ‘communication schedule’ that set out a schedule of times when either learner or teacher would be expected to make contact with the other was designed. The timing for communication was based on the three phases of meeting, guiding and moving on.

Fig 1: A model of supportive learning adapted from Lawton (1997)



All teachers agreed that each learner would be contacted during the first week of the module. In addition, it was agreed that there would be a cut off date of two weeks prior to the submission of an assignment, by which teachers could be expected to provide feedback on assignment preparation work. The interpretation of the three phases was very important for the modular structure of the programme. It was envisaged that every time a learner started a new module there would be a need to establish a new learner and teacher relationship and the three phases of the support model influenced both the timing of support and the nature of the relationship.

Study method

The study followed a naturalistic approach combining illuminative evaluation and case study [22]. The reason for selecting this approach was based on the need to bring to the fore the expectations and perspectives held by the participants in this case. Parlett and Hamilton [23] draw attention to two central concepts in the study of an innovative programme. These are, the 'instructional system' and the 'learning milieu', and in particular, the interaction between the two. This matched the focus of this study, which concentrated on the influence of the communication and interaction process, part of which was structured through the learner support system, on learners' confidence to learn.

All eighteen students who had enrolled on the programme as well as the four teachers who led the programme modules were included in the study. This 'theoretical sampling' [24] ensures inclusion of all individuals with special insight and who were able to represent important theoretical constructs concerning this particular case. In order to gain multiple perspectives and to facilitate triangulation, a combination of methods of data collection were used. These included; semi-structured interviews, student reflective accounts, documentary analysis and questionnaires. The collection of data followed a progressive focusing approach. Documentary analysis illuminated how the communication and interaction process had been visualised and planned and provided insight into the perspectives, assumptions, concerns and activities of those involved [25]. Such documents included notes of the programme management team meetings, general memos, validation documents, the programme handbook, module study guides and module evaluation forms.

Additional data was gained from reflective accounts completed by students at the end of the programme. The aim of the account was to encourage students to reflect on their own actions and those of their teachers. The reflective account was structured in such a way as to help them to focus on three particular areas. These were: the reasons for communication and interaction, the nature of the dialogue and the outcomes following the communication and interaction. A completed account was returned by each student. Each teacher was sent a questionnaire asking for their views on the kind of support that would, based upon their experiences, best meet the needs of learners to gain further skills in managing their own learning and increase their learning confidence. Each teacher returned the questionnaire with full and detailed comments.

Ethical considerations

Ethical approval was obtained from the University's Research Committee in accordance with the University's procedures. Following approval, a letter was sent to all of the eighteen students registered on the programme and included in the study, explaining the study and asking for consent to be interviewed and by doing so they consented. Anonymity and confidentiality were ensured and participants were ensured they could withdraw from the study at any time. The same process was followed for each of the four module leaders included in the study. No names were included in reports and all participants received a copy of the report produced from the study.

Data analysis

A process of open coding was used in which themes were identified based on issues and concerns that were important to respondents regarding communication and interaction. The result at each stage was a range of thematic perspectives that reflected student experiences that could be taken forward to the next stage (progressive focusing). After completing the analysis of stage one, the major theme emerging from

the student data was taken forward and it was possible to identify in the second interview its key elements. The final and third interviews focused on obtaining greater detail about the issues that emerged earlier. The interviews carried out with teachers were again semi-structured and designed to explore the teacher's perspective of the issues that had emerged from the student interview data.

Findings in relation to the learner support structure

One of the main findings from this study was that both students and teachers agreed that their relationship was closer than they had previously experienced in traditional classroom learning and teaching. This was most frequently expressed in the data as 'getting to know each other better'. The key characteristics of a close relationship focused on the ways in which learners and teachers broke down traditional barriers which then enabled them to develop a shared understanding of each other's role and responsibilities. It appears that the process of one-to-one communication and interaction when structured and focused towards increasing learners' confidence was the most important contributor to student's ability to gain confidence. Although student and student communication and interaction took place, it was not valued as greatly. This may be that as learners they were working and living at the same time as learning and learners often referred to key people who supported their learning as colleagues at work, friends and relatives, rather than other students on the module.

The communication schedule, according to the data, provided the guidance that both teachers and learners needed to either stimulate or maintain the process of interaction. Learners identified the greatest challenges in learning at the early stage of a module as; identifying and obtaining resources, planning to meet deadlines and maintaining communication with the teacher. A clear structure about when and how to contact each other acted as a prompt to remind them about their responsibilities towards each other, which in turn provided a basis for developing a close relationship. The early stage of the module represented a period when learners needed to know from teachers what they expected of them, They were looking for confirmation on whether they were 'on the right lines', using the most appropriate resources and whether they had interpreted the assignment guidelines correctly. Teachers were required to respond to learners and promote learner control, recognising individual differences during this stage of the module.

The data indicates that the times learners needed to communicate with teachers did not always coincide with when teachers wanted to communicate with learners. For example, after the early stage of the module learners withdrew from communicating until towards the final weeks of the twelve week module. This quiet period in the middle of the module represented a stage when learners had clarified what the teacher expected (in the assignment) and were drawing up the first draft of their assignment. However, differences in ability to plan and manage their own learning varied enormously amongst the small group of learners.

Teachers were a little troubled by the silence and needed to know how well the learners were managing. The lack of feedback from learner to teacher during this stage created anxieties for teachers. The 'guiding phase' represents a period when teachers were predominantly reactive and the 'moving on phase' represented a time when teachers were, for a second time, much more proactive. The proactive role included helping learners to build skills in planning, managing and taking responsibility for their own learning. For example, directing learners to prepare for how they intended to use the communication and realigning expectations of communication. Some learners had little insight into their own learning style and needs which required teachers to direct them to study skills materials. Teachers were frequently reminding learners of assignment submission dates and asking for evidence of learning plans. It seems that when learners and teachers shared control over learning, used time schedules that met both their needs and focused on developing skills in planning and managing learning, a closer relationship developed which contributed towards increasing learners' confidence to learn.

Examples of the reactive aspects of the teacher's role included reducing anxiety through a listening and deflecting approach and help to maintain motivation. Learners identified the importance of the teacher's role as one of validating worthiness and teachers encouraged learners to validate their knowledge for themselves in order to become less reliant on external validating processes.

Supporting learners, implications for the teacher's role

The high value placed on certain characteristics of the one-to-one communication and interaction required module leaders to find ways of managing one to one communication and interaction, taking into account individual learner characteristics, time efficiencies and scales of numbers for larger student groups. Central to increased personal communication was the use of e mail that provides a fast and time saving way of addressing large numbers of learners as individuals.

An important change to the teacher's role was based on the need to be proactive and reactive at particular stages of learning. The timing for the shift from one to the other was important if the needs of learners were to be more fully acknowledged. Data indicate that good planning, self-discipline and motivation, arguably powerful allies of all learners, were particularly important areas on which to focus the communication and interaction. A potentially invisible electronic learning environment gained the necessary visibility to enable a close relationship to develop because teachers recognised both individual and group learner needs.

Recommendations for further research

This research has outlined the process of on-line communication and interaction and its influence on confidence to learn. It emphasizes the importance of personal and interpersonal relationships and in particular a close, interdependent style relationship to further develop learners' confidence to learn. Clearly more research that can be applied to distance and e-learning education practice in the context of continuing professional learning and development needs to be carried out. For example, forms of communication media that offer choices that meet different learning styles and personal characteristics and possible organizational changes needed to implement a local framework such as this with a central support structure.

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Author

Dr Jane Morgan
School of Nursing and Midwifery
University of Southampton
Highfield, Southampton, England SO17 1BJ
J.M.Morgan@soton.ac.uk

RION AND EULISP: VIRTUAL EDUCATION IN LEGAL INFORMATICS

Dörte Gerhardt, Hanover University

Introduction

Research in computer supported teaching and learning gained in significance during the last decade. Several projects were started to introduce it into different subjects of education. An important aim of most of the last years projects was to gain long term effects by establishing online or offline learning and/or teaching environments. ELearning projects and electronic information systems have a long tradition in the field of legal informatics.¹ The Institute for Legal Informatics at Hanover University is involved in several eLearning research projects. The characteristics of the target group as well as two of these projects with their different aims and approaches will be introduced in the following.

The Institute for Legal Informatics at Hanover University

The Law Faculty of Hanover University is a comparatively small law faculty in Germany with approximately 2500 students.² Legal informatics has a long tradition at this faculty. Already in 1983 Prof. Kilian founded the first institute for legal informatics in Germany and established legal informatics as an optional subject. Kilian defines legal informatics as a subject enclosing the conditions, applications and consequences of information technology on the legal system.³ Research and teaching at the Institute follow this definition and its interdisciplinary component. Today, two professors, one assistant professor, five scientific collaborators as well as several students are working at the Institute.⁴

RION - Legal Informatics Online

RION (Rechtsinformatik Online) is a project to establish multimedia learning and teaching technologies in the field of legal informatics at German Universities. It is founded within the scope of the programme „Neue Medien in der Bildung“ by German government. Under the direction of Oldenburg University (Prof. Taeger) and Freiburg University (Prof. Schinzel) the Institute of Legal Informatics in Hanover is involved in the project as a content provider and responsible for the subject of data protection.⁵

EULISP - Postgraduate studies in the field of legal informatics

Excellent results in the final examinations as well as additional qualifications have a significant effect on the job situation of the graduates. Postgraduate studies in legal informatics have been established in Hanover in winter term 1999/2000 as one of the first LL.M. programmes in Germany.⁶ The students study one semester in Hanover and a second semester at one of the ten European partner universities. After their successful final examinations graduates receive the international academic degree „Master of Laws“ (LL.M.) for legal informatics. The study programme is part of a co-operation of eleven European universities located in nine member states of the European Union called EULISP⁷ (European Legal Informatics Study Programme).⁸

¹ The „Edition Umweltrecht“, a comprehensive information system on environmental law, was published by Taeger from 1990 until 2000, for instance. Other subjects followed.

² General information about the faculty and studies in Hanover are available at <http://www.jura.uni-hannover.de>.

³ See Kilian, W.: Warum Rechtsinformatik?, CR 17(2001)2, S.132-135.

⁴ For further information about the Institute look at <http://www.iri.uni-hannover.de>.

⁵ For further information about RION look at <http://www.ri-on.de>. For RION in Hanover look at <http://www.iri.uni-hannover.de/forschung/rion.php>.

⁶ See Kilian, W.: Ergänzungsstudiengang Rechtsinformatik, CR 15(1999)9, S.599-601.

⁷ EULISP is an registered European label.

⁸ For information about EULISP, the partner universities, the content of studies and so on look at <http://www.eulisp.de>.

Each winter term a maximum of 20 students with outstanding results in the first state examination get a place at the legal informatics graduate study programme EULISP in Hanover. About 14 different courses in legal informatics are offered during the semester. Topics comprise general aspects of legal informatics in a European context, data protection law, theory of law, law of data banks, law of software contracts, media and telecommunication law as well as technical basics of data processing, different aspects of data security, electronic signatures and cryptography. A virtual classroom was established to support students and teaching in legal informatics within the EULISP programme.

Characteristics of the target group

E-Learning in legal informatics focuses to very different target groups. Within the RION project students and postgraduate students of law as well as students of other subjects like economy or computer science are concerned. The widespread interests, knowledge and experiences have to be taken into account in designing eLearning facilities. In winter term 2001/2002 the different user groups involved in RION were asked to answer several questions concerning the position of legal informatics in their studies as well as their knowledge about and attitude to computer technology.⁹ In Hanover the characteristics of postgraduate students of legal informatics are regularly investigated.

Students

Approximately a third of the EULISP students in Hanover are women and two third are men. Half of them have already passed the second state examination. Some of them have a Ph.D. degree. Most of the postgraduate students start the studies in legal informatics immediately after the state examination. Only a few have some years of work experience. The average age of the students is 28,1 years.

Computer equipment and knowledge in electronic data processing

A fully equipped auditorium is available for the EULISP study programme in Hanover. Students can work at workstations in the auditorium during the breaks between the lessons or use them for team work during the lessons. Of course Internet connection is available for their own notebooks in the room. Next to the auditorium is a computer lab, accessible for the students as well.

EULISP students of three different semesters were asked to answer some questions concerning their computer equipment at home, their knowledge in electronic data processing and their experiences as well as attitude concerning eLearning. 42 students (27 men and 15 women) answered the questionnaire. The average age of this group was about 27,9 years. This survey reflects the average age as well as the general ratio of distribution of men and women studying legal informatics. Interpreting the questionnaires no significant differences between the answers of men and women were found. Therefore, no sex-specific distinction has been made in the evaluation of the survey.

EULISP students in Hanover spend in average 106 minutes per day at the computer. They read their emails about 1-2 times per day. The numbers show a clearly increasing tendency. The students of the summer term 2000 spent about 87 minutes daily at the computer and checked their email 1,4 times per day. The summer term 2003 students spent 148 minutes at the computer and checked the email 2,6 times a day. 80% of the students have their own computer at home, 17% of them use a notebook. Windows 95/98/NT/2000/XP is the common operating system. Only two students use also the operating system LINUX and one student owns a Macintosh-PC. Most of the students use the computers in the auditorium and in the computer lab, especially because of the internet access free of cost. Main reasons for the use of the computer by the students are for 93% of them text processing, for 69% emailing, for 43% private investigations in the internet and for 36% looking for professional information on the internet. The students appraise their knowledge concerning the use of text processing, the Windows operating system, email and WWW to be average or better. No or only few knowledge as well as no experiences exist in using internet news, chat, mailing lists or computer conferences. Most of the students never used

⁹ For results of the investigation see Müller, A.; Knirsch, S.; Nett, B. etc.: Zwischenstand der Evaluation, in: IIG-Berichte 1/03 - Ausgewählte Studien der Begleitforschung zum Projekt Rechtsinformatik Online, Freiburg 2003.

eLearning software or facilities. They are neither experienced in building their own web sites nor in programming. Only one of the students had experiences with lectures accompanied by web pages before.

Motivation

98% of the students can imagine using eLearning in addition to the traditional teaching and learning methods. 55 % of the students do not believe in learning only by means of using interactive media. After an introduction into the „EULISP Virtual Classroom“ 88% of the students answered that they are willing to use this facility.

The students were asked to express their opinion concerning eLearning in comparison with traditional methods of learning. The following table shows the results, where the numbers reflect how often the corresponding square of the table was checked. Not all of the 42 students answered to all questions.

How do you value computer supported learning concerning traditional methods?

The integration of „Virtual Classrooms“ in the traditional education.....						
... supports thorough studies.	15	10	13	0	0	...leads to superficial studies.
...makes it more difficult to identify links between different subjects.	0	1	14	12	12	...makes the identification of links easier.
...supports creative thinking.	6	11	20	2	0	...prevents creative thinking.
...offers less independence and a lower level of self-determination.	2	1	9	10	17	...offers more independence and a higher level of self-determination.
...will make traditional ways of teaching (e.g. lectures) unnecessary in future.	1	2	6	8	23	...is able to supplement traditional ways of teaching, but won't replace them.
...essentially facilitates the access to teaching aids.	23	14	3	0	0	...does not offer advantages compared with traditional methods (libraries etc.).
...supports the careful preparation and revision of the lectures.	23	12	3	2	0	...prevents the preparation and revision of the lectures.

Most of the students asked agreed in the fact that computer supported teaching makes the access to materials easier (88%). 83% of the participants declared that lessons are easier to prepare and revise. Concerning the question whether computer supported learning supports or prevents to identify links between different subjects 33% answered ambivalent and only 57% agreed. 38 % of the students could not decide whether computer supported learning influences the creativity of learners. Only 40% answered this question positively.

Additionally, it was asked for the opinion of the participants concerning computer supported communication.

How do you estimate the influence of computer supported communication on learning?

The use of computers to communicate (email, computer conferences, newsgroups, chat....).....						
... influences studies in a positive way.	20	9	11	1	0	... influences studies in a negative way.
...supports professional discussions.	16	14	9	0	0	...prevents professional discussions.
...takes more time.	7	11	10	5	8	...saves time.
...is often coupled with technical problems.	5	4	15	10	7	...is seldom coupled with technical problems.
...supports creative thinking.	5	9	24	2	0	...prevents creative thinking.
...makes it difficult to participate actively in discussions.	1	4	13	12	10	...supports to participate actively in discussions
...makes it easy to co-operate with others.	25	11	5	2	0	...prevents co-operation.
...is a useful method to support organization of lectures and is more useful than traditional black boards.	28	8	5	0	0	...is less effective in broadcasting actual messages than traditional black boards.
...makes face-to-face communication between students and lecturer (e.g. office hours) unnecessary.	0	0	4	13	22	...won't replace face-to-face communication with the lecturer.

The results of this part of the questionnaire are spread out widely, too. One reason why students often choose the neutral position (that means the inability to take a clear position) can be explained with the lack of experiences concerning the use of interactive computer based teaching and computer based communication (except of email).

In general a higher motivation of the EULISP students concerning their studies in comparison with the whole group of law students can be noticed. They already finished a state examination successfully and started postgraduate education to improve their chances on the labour market. This high motivation is expected to affect the willingness of the students to try new methods of learning.

Web based support of the study programme is essential to solve problems of organization (e.g. to contact partner universities or students abroad or to publish several information about the programme) and to support teaching and to publish teaching materials. Because of the consequent use of internet for communication and publication purposes students are compelled to use this media in their daily work and to tackle with it. Besides the motivation of the students to use internet supported teaching facilities, there exists in fact also a necessity to deal with it.

Computer based Teaching and Learning

The Institute for Legal Informatics in Hanover is involved in several eLearning research projects. These activities are integrated into the project „Intelligente Lehr- und Lernsystem in der juristischen Ausbildung“ (Intelligent systems for learning and teaching in legal training - ILLJA).¹⁰

The EULISP Virtual Classroom (EULISP-VC)

First stage of the project: Support organizational aspects of the study programme

The development of the EULISP Virtual Classroom takes place in two steps. In the first stage a database based web site was developed to support the organization of the study programme. Available tools to organize classrooms and courses of studies were evaluated for this purpose. Unfortunately, none of these tools met our demands. Most of them were too extensive and much too complicated to use for our purpose to organize a postgraduate study programme with only a small number of students. Therefore we decided to build up our own solution and realised it in a very cost and time effective manner.

The first version of EULISP-VC is online available for more than two years now. Applicants for the study programme are able to fill in their application online. The data are saved in the EULISP data base. EULISP students get a password protected access to the EULISP-VC. They are able to administrate their personal data, e.g. to edit changes of address, telephone number or email-address, and to define access rights of other users for their personal data. For instance they can allow students of their own or any other semester to see the email address and to contact them. The transfer of the data via internet is encoded via SSL. Special web forms support to search for students and to contact them. One very common feature to search for is the place where students of earlier semesters spent the semester abroad. Students are interested to contact them to ask about conditions at the foreign university (apartments, contact persons, main areas of work and teaching. The results of a survey among the students of summer term 2003 show that students use the possibility to look for other students in the data base very often. Students also use the EULISP-VC to check their examination results and to update personal data. The user interface of EULISP-VC was judged with 1,6 on a scale from 1 to 4. The user friendliness was scaled with 1,5.

Second stage of the project: Integration of teaching materials

EULISP lecturers publish materials, scripts, links, bibliographies in the web and use different online facilities for communication with students. Initially each lecturer was responsible for his own internet

¹⁰ See Funkat, D.: Virtuelle Lehr- und Lernräume in der juristischen Ausbildung, in: Wagner, E.; Kindt, M.: Virtueller Campus, Münster 2001, S. 75-83. For information about ILLJA look at <http://www.iri.uni-hannover.de/forschung/illja.php>.

site. The online supply on teaching materials was not standardized, a global structure especially for news or downloads did not exist. If a student was looking for new materials for all of his subjects he needed to go to the web sites of each of these subjects to read or download it. This procedure is of course time consuming and does not correspond to the modern facilities of the media. Because of this reason new online facilities of the EULISP-VC accompanying lectures were designed.

Basis for this second stage of the project was an investigation into the specific characteristics of learning in the legal field as well as an evaluation of existing computer based legal teaching and/or learning systems. In order to realize the new features of EULISP-VC it was necessary to find an optimized solution in regard to expenses and effort. Within the scope of the projects ILLJA and RION available tools to implement online teaching and learning environments were evaluated. None of those tools met the demands of EULISP-VC. Therefore our own solution using a SQL data base was implemented. A first test of this online teaching and learning environment is expected in 2004.

The new features of the EULISP-VC are implemented to support teaching and will be integrated in the EULISP study programme. A replacement of traditional teaching – e.g. by introducing online seminars etc. - is not yet planned. Elements of EULISP-VC are a blackboard to publish news concerning the study programme or special lectures, teaching/learning materials and communication facilities. Each lecturer can decide which of the facilities he may integrate into his lessons using a web based interface. A student logging in the VC gets first of all an overview about all new materials and news concerning all of his courses which were published since last login. If a student chooses the web pages of a certain course, he is able to leaf through the topics of the course or to change immediately to another course.

RION

The focus of the RION project is much wider than the focus of EULISP-VC. Instructive as well as co-operative methods of eLearning were implemented and tested.

- **Multimedia textbooks**
The content partners of RION were responsible in providing textbooks of different subjects in the field of legal informatics. Co-ordinated by Oldenburg University the textbooks are published electronically as well as traditional paper books. Hanover was responsible for data protection.¹¹
- **JURMOO**
The acronym MOO means object oriented “multi user domain” (MUD). It can be seen as a number of linked web-pages which are described by „rooms”, „characters” and „objects”. Participants are able to choose their own characters and to communicate through them. Every user of the MOO can „move” between the rooms, read the room description and interact with other people (characters) in the room. JURMOO was designed at Freiburg University especially for the context in legal informatics.¹²
- **Online seminars**
Different online seminars in legal informatics were realized by RION. The first global seminar took place in winter term 2002/2003 with a conventional basic concept: Students wrote papers about different topics which were published online and discussed synchronous and asynchronous. In summer term 2003 the concept was changed to a interdisciplinary and global treatment of the different topics. The JURMOO was adapted to support preparation and discussion within the seminar.

Results and Outlook

Online teaching in the legal field is still a difficult problem. Especially law students are often not willing to use the computer for co-operative learning. The RION experiences for instance at

¹¹See Scheja, Gregor: Einführung in das Datenschutzrecht in Taeger, J.(Ed.): Studienbücher zur Rechtsinformatik, Band 3, Oldenburg 2003.

¹²See IIG-Berichte 1/03 - Ausgewählte Studien der Begleitforschung zum Projekt Rechtsinformatik Online, <http://www.ri-on.de>.

Oldenburg University show, that chat was not able to improve scientific discussion between the students and did also not develop the rhetorical abilities of the students. The JURMOO was to complex to be effectively used in online seminars. The results of a survey show furthermore that the expense for the persons in charge of the online seminars was enormous.

On the other hand online textbooks and teaching materials are accepted by law students. EULISP students were asked during summer term 2003 whether they use the materials published online. 74% answered that they normally look for new online materials before a lesson takes place. They download the materials and print them but they do not (45%) or only seldom (55%) check them to prepare a lesson. Only one student normally reads the published materials on the screen, 55% of the students only print materials, the rest also sometimes reads on the computer screen. 45% of the interviewees always revise the lessons using the online published material, 36% do it most of the time the others only from time to time. All students use materials to prepare their final examinations. Lists containing links and references are very seldom checked by the students. Only two of them answered that they preponderantly investigate the literature, 55 % do it from time to time, the others not at all. The news of the EULISP-VC were welcomed by all students. Especially the consistent form of publication, the easy access to new information and the new communication facilities were expected to be important. The numbers show, that despite the high motivation of the students most of them are not willing to prepare the courses. On the other side the numbers show the importance of an online supply of teaching and learning materials and communication facilities accompanying a lecture.

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Author:

Dr. Ing. Dörte Gerhardt
RION Projektbüro Oldenburg
Institut für Rechtswissenschaften
Fakultät für Informatik, Wirtschafts- und Rechtswissenschaften
D-26111 Oldenburg

AN EVALUATION OF AN ONLINE ICT COURSE: STUDENT PERCEPTION, SUPPORT ISSUES AND LECTURER INVOLVEMENT

Adriana Gnudi, Agostino Lorenzi & Lucia Malvisi, University of Bergamo

Introduction

The acquisition of basic Information Technology and Communication (ITC) skills is considered a vital starting point for students in the first year of any University course. At the Economics Faculty, Bergamo University, Italy, a level one Informatics course is offered to all students newly enrolled on a degree course within the faculty, in order to achieve a uniform standard in first year students. Many of the students who enrol in the Economics Faculty have studied at Technical and Professional High Schools and come equipped with a sound background in computer training, whilst others who come from more traditional high schools have few skills in this area or the ITC knowledge they possess is less well consolidated. The module offered also sets the standard for the minimum ITC skill set required by a student embarking on an undergraduate course.

With the advent of new technologies in the field of e-learning, it was also decided that the ability to work within a Virtual Learning Environment (VLE) should become a core skill for any student beginning a degree course within the Faculty, thus serving as the basis for further development within subsequent modules of a degree course. It seemed opportune, therefore, to introduce an e-learning activity within the Informatics module.

One difficulty facing all modern Universities is large cohort numbers. By allowing students to participate in courses through VLEs, many of the problems associated with large classes are resolved. Student support becomes more immediate within an online environment, where students have greater access to interaction with lecturers, which in traditional classroom based courses is either infrequent or lacking completely. As noted by Cavalli and Lorenzi “distance learning becomes active learning...the lecturer is the instructor who moderates activities, whose principle objective is to facilitate learning.” (Cavalli and Lorenzi 2000). On-line teaching can reduce the gap between lecturer and student and between the students themselves; a smaller classroom group is created virtually, which in the large cohorts of traditional undergraduate courses is lost. Virtual Learning Environments also allow for the introduction of key elements in student centred on-line learning, such as:

- the ability to structure the course into distinctive modules or learning units
- the facility to undertake tests and assignments on-line
- the possibility to interact with lecturers and students via the web
- the ability for students to participate actively in the course by posting questions and replying to discussion threads, as well as reading or downloading files

Thus it is hoped that students will undergo a change in their learning culture, achieving a different approach to study compared to their classroom peers as:

- students develop a more collaborative mindset, they receive positive feedback from lecturers and from other students and in turn contribute more actively to the course
- the virtual classroom allows for peer learning amongst students, where they ask and reply to each others' questions independent of any lecturer input
- teaching methods and learning processes change within a virtual environment: active participation from the students directs the lecturers' teaching and the students receive a more personalised form of study

- as students become more accustomed to the virtual environment, they begin to see the internet as a conduit to other material and information which will develop their studies
- students learn to evaluate for themselves the wealth of material offered on the internet and become adept at discerning which information is best suited to their needs.

Evaluating the module

Evaluating and monitoring of courses or modes of study is vital within any learning organisation in order to ascertain effectiveness. The Economics Faculty decided to undertake both a quantitative and qualitative evaluation of the distance mode, in order to judge whether students had performed as well as their classroom peers and to find out from the students themselves, whether this different mode of delivery had indeed provided them with the ICT skills they sought to acquire. As well as supplying demographic data about themselves on enrolment, students completed an initial questionnaire on expectations of the course where they were also asked to judge their own ICT skills. At the end of the course, students completed questionnaires on the course itself and their performance after it.

The themes dealt with in the questionnaires were:

- ICT skills – students own evaluation of their skills before and after the module
- Support – from materials, tutors and interim tests

It was also important to ascertain whether the students had received the support they needed through the VLE and to try and judge whether they were developing a collaborative mentality and more mature learning style that is fundamental to effective distance learning.

The module is run in at the beginning of the academic year and the September 2002 course is evaluated in this paper. The exam marks of the two cohorts were compared and questionnaires completed by distance students were analysed. Forums and online discussions were also analysed from the point of view of how many students participated, how often and with what type of question was posted. Lecturers' use of discussions was also analysed.

Organisation of the distance module

127 students actively enrolled on the classroom course and 123 enrolled on the distance course, although as the course was open to all students within the faculty, more students actually took part.

Distance students underwent six teaching hours in the lab with a lecturer and 19 teaching hours online. The six classroom based hours were divided into three lectures each two hours long, the first at the beginning of the module, the second in the middle and the third at the end. Lotus Learning Space was used as the Virtual Learning Environment for distance students and each person was given a specific log-in name allowing them to participate in discussion boards (asynchronous forums), send assignments electronically and undertake tests on-line. Distance students were subsequently divided into six subgroups, each with its own lecturer. Each lecturer (or 'tutor') managed their group independently and would participate in discussions as and when they chose.

At the end of the module, a final exam was taken online by all the students in person at the University, using the University's PC labs. Distance students also took four interim online tests during the course (called assessments), which were marked by the programme Learning Space and they also undertook other interim exercises (assignments), marked by the group tutor.

Students from both groups had access to the University's PC labs reserved for e-learning purposes.

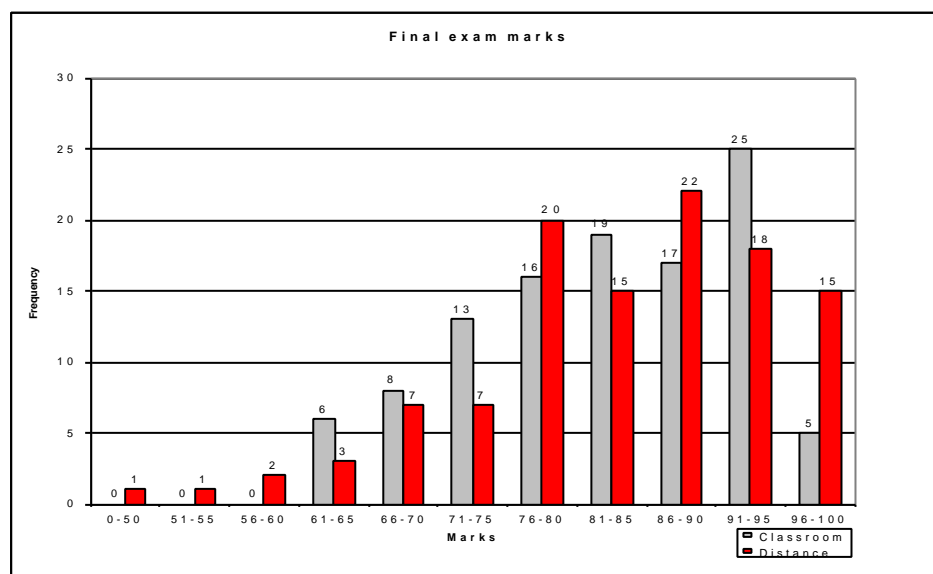
Student profile

At the start of the module 183 classroom students and 189 distance students completed questionnaires and supplied demographic data about themselves. Almost 20% of the distance group were not enrolled in the first year at university but were in other years, whereas in the classroom group, only 3% were not first year students. At the beginning of the course, 24 distance students claimed not to be full-time students, as opposed to only three classroom students. As has been shown in other studies (Gilroy et al, 2001) the distance learning environment tends to be favoured by non traditional students, that is students who may be older, who work or who have other obligations, such as family, that do not allow easy access to traditional classroom courses.

Exam marks

109 classroom students and 111 distance students took the exam at the end of the course. Both groups scored highly in the final exam with 92.5% as the mode for the classroom students and 87.5% as the mode for distance students. Only four people in the distance cohort who took the exam did not pass. Although the classroom students performed better than the distance cohort, this may be due to the fact that the course itself focused largely on the practical use of computers and IT applications, rather than being a purely abstract theory course. The classroom students were able to have more guidance from the lecturer with regards to how to operate the Windows system, for example, whereas the distance cohort only had access to asynchronous forums in which to ask for help and advice. Future distance cohorts will be offered a CD with animation that will take them through certain moves directly on the computer in order to overcome this gap. However, when this is taken in to account and considering that the distance students also had to change their learning habits to include a new form of interaction with peers and lecturers, as well as mastering new technology, the results of their exams shows a notable success for the online course. Undergoing interim online tests almost certainly contributed to the success obtained by the distance students in their final exam. Most of the students who achieved over 70% in their final exam took all four interim tests offered online. The online environment allows students to continually verify the level of the new skills they are learning, thus providing a more stimulating environment for the learner.

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Student perceptions

The aim of the initial and final questionnaires was to establish the efficiency of the course based on subjective perceptions of the student participants. Evaluations were made based on the categories ‘not at all’, ‘little’ ‘average’, ‘a great deal’ and ‘insufficient information to reply’, with students evaluating sentences such as:

- ‘I am familiar with general IT concepts and know how to use a PC on a basic level’ (at the start of the module).
- ‘After the course, I feel I am familiar with general IT concepts and know how to use a PC on a basic level’ (at the end of the module).

The table below shows the differences in the categories “little” and “a great deal” for the distance students at the start and the end of the course. Although any changes in skills and knowledge were self assessed, the distance group felt they had progressed considerably after the course. This is especially true as regards the Internet and its uses. As distance students could immediately practice new internet skills acquired through the medium they were being taught in, they may have felt a more marked increase in their abilities and confidence. Students enrolled on the distance mode had to overcome the newness of the very environment they were being taught in, with the need to familiarise themselves with the PC and the change in their mentality to one of a more collaborative student. Nevertheless they demonstrated a stronger sense of achievement than the classroom students once they overcame the initial difficulties. In recent research undertaken by the Open University in Britain, one reads “many students go through a very steep learning curve at the beginning of the course...most of those who stuck with it till the end reported a tremendous sense of achievement.” (Weller and Mason, 2000). As mentioned in the introduction, one objective of the course was to accustom students to using the Internet as a source of information and thus create a more mature and autonomous attitude towards their own learning.

Units in the module	Category	Before course	After course
UNIT 1: General computer use and IT concepts	A great deal	1%	20%
	Little	38%	1%
UNIT 2: Windows Operating System	A great deal	11%	36%
	Little	15%	2%
UNIT 3: Word	A great deal	13%	35%
	Little	19%	2%
UNIT 4: The Internet and its uses	A great deal	5%	29%
	Little	19%	2%

Support

Traditional types of support, such as those offered by a lecturer to students or that gained by undergoing assignments were seen by the distance cohort in a very different way to the classroom based students. When asked to express opinions on how much they would use online materials or handouts, just over 40% of distance students expected to use them a great deal. This figure rose to almost 70% after the course, when the students had had the opportunity to consult the materials online. On the other hand, at the start of the course 47% of distance students expected to make use of tutor support ‘a great deal’, with just under 5% only expecting to need tutor support ‘little’. At the end of the course the changes were dramatic. Over 40% of distance students claimed to have needed tutor support ‘little’ at the end of the course and only just under 4% claimed to have used tutor support ‘a great deal’.

Various hypothesis present themselves as to understanding these figures. Before commencing the module and while still within the mentality of a classroom student, distance students may have expected to use traditional forms of support (such as asking the tutor for help) in the usual way. Once on the course, they develop into more autonomous learners, able to access online materials at will,

with less need to 'ask the teacher'. As Dr S. Quinsee of City University London notes "distance students appreciate the fact that they access materials and respond to them as they feel appropriate. When students are pushed for time the ability to engage in this form of learning is beneficial" (Quinsee 2000). Time management skills and the ability to login whenever and wherever may mean that students are looking for support at times when it is physically impossible for tutors to be available, late at night for example. Thus they turn to other means and become more mature about taking control of their own learning. In this way the online environment leads directly to student centred learning. The online environment also radically changes the interaction between student and teacher and between the students themselves. Peer learning becomes a much more integral part of the learning experience. As we shall see in the analysis of the discussion boards below, students created a collaborative web amongst themselves, where knowledge transfer was not solely dependant on the lecturer as is more usually the case in the classroom. Interestingly, lecturers also participated actively within the discussions posted. It may be that it is precisely the fact that student had access to information that was not directly meant for them, that may have given them the impression that they were not benefiting from tutor support, when in fact the opposite is true.

Discussion rooms

About half of the distance cohort participated actively within the discussion rooms for the module. By far the most popular topics to be posted by students to their peers were questions on either the organisation of the module itself (deadlines for tests etc.) or technical questions, such as how to attach files to documents within Learning Space. The ability to post questions to a significant number of peers, as opposed to turning directly to a lecturer, is vital for the online community. A collaborative network is established between online students, independent of the lecturer, who (the students fear) may judge the student too harshly or doubt their technical ability. The student becomes more empowered through the forum environment. By answering questions submitted by peers, they begin to feel that their input is valid. As Dr WG Lockitt says of his research into individual learning styles and e-learning "all learners identified 'hands-on' as the preferred method of learning...the overriding feature of the term hands-on given by respondents focused on the involvement of the learner in the learning process and the perception that their input was being integrated into the learning process itself." (Lockitt 2002).

Replies to discussion threads were posted up fairly rapidly, by both students and teachers, with intervals of usually a few hours and rarely more than a day, demonstrating that discussion boards were checked fairly regularly by both staff and students. However, in many instances when questions by students were directed to the whole group, lecturers would reply rapidly, without leaving enough time for other students to reply. This may be a reason why students, having started to use discussion cards as a way of interacting with each other soon gave up this practice and reverted to the traditional student/ teacher role, where they waited (not for long) for the lecturer to supply the correct answer. Even in instances where a student replied to questions posted by a peer, a lecturer would also supply the 'correct' answer, thus removing the possibility for students to work out a solution together. Quinsee noted that "it is tempting for lecturers to contribute too quickly to discussion board postings. This can lead to a build up of expectations the students and in fact impede communications...if this is not addressed resentment may build." (Quinsee 2000). She suggests 'lecturer hold back', with tutors deciding together at the start of the module how and when to reply to discussion postings. This allows students enough space to interact with each other, thus establishing for themselves the parameters of their virtual environment and therefore taking ownership of it. Lecturers should participate in online discussions, but it is important that they too, do not transpose the traditional classroom roles onto the elearning environment. The distance students here were beginning to create a virtual community that would have given them a different type of support than the ones they were traditionally used to, however this seems to have been truncated fairly early on. If lecturers want students to look on VLEs as new and effective ways of learning, they must allow students space to manage the online environment as they desire.

Conclusion

When evaluating the IT skills module run for distance students, one can say that it was a success from various points of view:

- all the students who took the exam, apart from one person, passed;
- the majority of students felt that their IT skills pertinent to each single component of the course had increased;
- half of the distance students actively participated in asynchronous discussions, thus establishing a collaborative community with other students and with lecturers;
- students used the new technology to take on-line tests to their advantage; those who took a greater number of tests gained a better mark in the final exam;
- most made use of the online materials available as demonstrated in the questionnaires they compiled;
- the students now have valuable experience in using Learning Space.

One was able to see changes in the distances students approach to learning as the module progressed, with the increase of autonomous learning and a move towards a collaborative community where the lecturer is no longer at the centre but rather the students feel that their input is worth something to the cohort as a whole. New support issues have been raised, especially as regards lecturer participation. Students certainly gained from the course and will continue to take advantage of these gains in the future, both when using their ITC skills and through their learning patterns. It is worth noting that a distance environment necessitates a different learning mentality both on the part of students and lecturers if it is to be used to its full potential. It is vital to allow a certain organic growth within the VLE during the course of the module.

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Authors

Prof. Adriana Gnudi
Università degli Studi
Bergamo, Italy
adriana.gnudi@unibg.it

Prof. Agostino Lorenzi
Università degli Studi
Bergamo, Italy
agostino.lorenzi@unibg.it

Lucia Malvisi
Università degli Studi
Bergamo, Italy
luciamalvisi@tin.it

SOFT SKILLS IN ONLINE EDUCATION

Gudrun Görlitz, Oliver Grimm & Stefan Müller, Technische Fachhochschule Berlin

The online studying-modules „Grundlagen der Programmierung I und II“ (“Basics of Programming I and II”) of the Virtuelle Fachhochschule (University of Applied Sciences) contain two complete programs for online-studying, which in conventional teaching consist of approximately 15 weeks of lecturing and exercise. The “Virtuelle Fachhochschule” (VFH) is an Online University of Applied Sciences in Germany, that is promoted as a leading project of the German Federal Ministry of Research and Development (BMBF). The first students enrolled in October 2001 for a bachelor’s programme in media computer science. A programme in industrial engineering started in October 2002. In this context, an interdisciplinary team at the Technische Fachhochschule Berlin (TFH) designed 12 online studying-modules.

1 The Approach in Research

The aspect of research in the VHF-Project consisted of an analysis of the possibilities of developing a teaching and learning-scenario with designing-tools, in which the enlargement of various practical skills is supported. Tasks orientated at didactical questions served as theoretical basis of the development of studying material, as described by Gerhard M. Zimmer in the “Didactical Guidelines for Constructing Studying-Modules” [5]. Didactics orientated at exercises propose the conceptualisation of tasks and practical skills. The term practical skills wants to describe personal and acquired qualifications by which individuals are enabled to a competent and capacious treatment of tasks. Following Zimmer, practical skills include several categorical aspects: specific knowledge, specific skills, methodical skills, decision-making authority, social competence, practical interests and authority in judgement. The social competence, which is described here in detail, corresponds to the individual as part of a social group and primarily means communicative respectively co-operative competences, “which are necessary to communicate and co-operate with each other in order to solve a complex tasks requiring several persons [3]. The theoretical mediation of social competence in organised arrangements is mostly seen as difficult. In realization, the design has to fulfil the demands of special functions.

2 Planning-sphere

The working-sphere of a college graduate is characterized by division of work and interdisciplinary teamwork. This is in particular is a demand to computer scientists. Learning social competence therefore is a crucial point of computer-science studying and is trained by common usage of close-to-application tasks in conventional studying. The students are supposed to learn to hold responsibility for a project as a group. For this, it is necessary to lead discussions efficiently and orientate them at aims. Practicing and bearing criticism are also important issues to learn. The result of work is to be presented appropriately [1]. Often enough, social competence is gained as a side product during an unofficial exchange of information and experience outside of the laboratories and lecture halls.

In opposition to this, online-learning normally tasks place isolated in domestic environment. Individual learning at a personal computer – independent of place and time – is the big advantage of this learning process. But spontaneous interpersonal influences normally do not occur in this form of learning. In the Berlin Team application-oriented research in the field of computer-supported communication is done. The main questions are how could teamwork and communication processes in be initiated and promoted. For this purpose communication programmes are integrated into the learning material in order to deal with the lack of social contact. Communication near to its contents, synchronous and independent of location is possible for the students through an instant messenger. Questions concerning content and feedback dealing with virtual learning environment and which are directed to the mentors are answered by a dynamic, web-based FAQ-forum.

Didactical planing requires an appropriate usage of design-elements and communication tools [4]. Based on the experiences from the didactical model of conventional studying, various fields like training-objectives, learning-contents, methods and media have to be considered. The didactical design of online studying-modules can be divided into several production-steps:

- describing the structure of relevant topics and assessing the objectives and contents,
- choosing the appropriate method for the mediation of knowledge,
- planning the communication scenarios and interactions according to the used media types,
- visualizing the learning components and then integrating them within the learning environment.

The following illustration shows the students view of the module and an explanation of the implemented functions.



3 Design

Graphic design is essential for the mediation of professional knowledge. This can be seen quite differently. It can be put into a context near to practice, for example. Text, graphics, illustrations and animations belong to the main components of design and are used for the presentation of complex learning-contents. Furthermore, and depending on the specific contents and aims of learning, interactive components like roll-over graphics, slideshows and interactions were outlined. Sample programmes in form of source-codes, screenshots and downloadable and executable files consider the specific requirements of programming-training. Additional to the visual components of design, avatars were developed, which ask questions concerning scenarios typical for conventional studying. These questions and answers were implemented as audio-stream. Integrated exercises and tests as well as tasks which have to be sent in enable the students an efficient control over their individual learning progress.

Questioning belongs to the learning-process. Not only for the questioner, but also for the others studying as well as for the developer of learning material, questions are valuable feedback. The FAQ-forum is an application integrated into the modules of studying. The student direct their questions concerning the usage to an ,expert' (mentor) via online. Questions from all locations and courses are registered centrally and mentors are informed by e-mail. They can edit and answer the questions through a web interface. If wished, also the questioner gets an answer by e-mail. Question and reply become part of the FAQ-list and are visible for all students of the module. On the one hand, developers get hints concerning

malfunctions and gaps in the learning material, on the other hand the students have the possibility of making suggestions to improve the modules besides questions of contents.

A series of trends and tendencies can be derived from a done enquiry of 170 registered online students in the winter-semester 2001 in the frame of an evaluation. To this, for example, belongs that two thirds of the asked students felt, that the contact to others were too little, despite all given communication-tools [2]. The development of the buddylist is a direct reaction on this result. With the buddylist the students possess a communication tool, which enables them to be aware of the presence of other students and contact them directly. Through this, the personal and the professional exchange as well as the co-operative work among the students is improved. The FAQ-forum and the buddylist are client-server applications to which access is possible from the entire studying module. The general availability has the advantage of a bigger group of potential communication partners learning to the same time. Through this, the learner's feeling of isolation can be reduced.

Apart from the problem-orientated handling of the course-material and the multimedial presentation, students are motivated additionally by the integration of an instant messenger with a configurable buddylist. This makes communication between students easier and is a direct reaction to the frequent criticism of the 'isolated' learning situation of online students. Students working within one of these studying modules are visible to each other in form of their username. Contact is possible by sending a short message. In the first two terms, contact without buddylist was only possible by e-mail, newsgroup and fixed chat meetings, which are the communication-tools provided by the learning management system Blackboard.

With this integrated solution an overlapping communication between students of one module but of different locations and personal conversation like in conventional studying is now possible. The exchange of information is not initiated and serves common work without a preformulated setting of tasks. For the development of complex programmes, communication between students as well as with mentors is essential viewed from the aspect of team-orientated work. Usually, students work with the exercise programmes deferred and in different places. Helped by the buddylist, students working at the same time can adjust their methods of working by chat or discuss their source codes with each other.

4 Support

The personal support of students has in practice proved effectively improving the development of social competence. This support contains:

- realization of face to face-phases in the computer laboratories,
- online support during work within the learning module,
- correction of the sent-in-tasks,
- realization and correction of the examination.

Evaluations at the locations showed, that two different concepts of attendance have developed. While the phases of face-to-face teaching are supported by professors, the online attendance is usually done by tutors, who co-operate closely with the professors. At some locations professors do the entire attendance on their own, i.e. they additionally take over the attending role of the mentor. It showed that the evaluation had in most parts the same results independent of the attendance conception. It was surely significant, that 96% of the asked students thought the attendance to be an important success-factor.

The face to face phases were outlined as two six hour block-lectures each. During the lectures, complex and praxis-relevant tasks of programming covering the former learning-units are to be dealt with as a team. The setting of tasks is compiled by the supporting professors and enable an individual approach of each group. Even though most of the students met for the first time physically in the face to face-phase, it showed that they had already formed groups. Apart from the online communication, some students even had met before in groups to solve their exercises.

The range of exercises in the on-line attendance is wide. To first-year-students, questions concerning organization and techniques of online studying are as important as those concerning contents. The exchange over newsgroups, which are integrated in every learning management system, have proved to be reliable – as most of the questions deal with general topics.

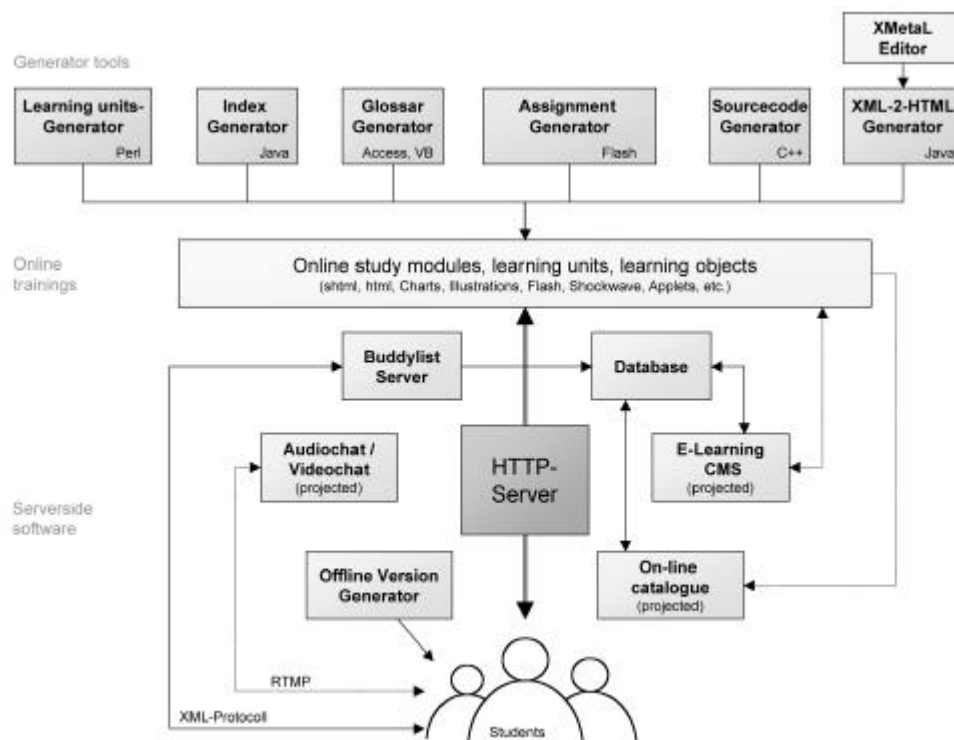
For inquiries referring to the learning-material students prefer personal e-mail, which increases the e-mail traffic very much. Student assistants, who read these e-mails and reply in a short period (max. 24 hours) of time and only pass on difficult questions to the supporting professor, have proved to be useful.

Likewise, tutors who control the sent-in tasks affect the learning process positively. Learning-contents are explained from a different point of view as the professors do. Experience shows, that tutors demand a more consequent and comprehensive correction of the developed programmes. Before delivering the sent-in tasks, special problems are discussed in chat sessions.

5 Production

The VFH work-group at the University of Applied Sciences Berlin developed an entire group of production tools using different techniques to automatize recurrent, identical or equivalent problem-definitions. Elements of design supporting the development of competence can thus be integrated into modules of studying in a large number.

The following chart gives a survey of tools used in production and practice:



6 Conclusion

Using the studying modules „Programmieren I und II“ has showed, that purposeful guidance, didactical design components and support through modern information technological solutions supported the development of competence in a wide range. Further technical improvements, as in the field of synchronous communication, also enable the development of competence corresponding to conventional studying.

A brief example is available in the internet: <http://vfh100.tfh-berlin.de/~lernraum>

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Authors

Prof. Gudrun Görlitz
University of Applied Sciences
Luxemburger Str. 10
D - 13353 Berlin
goerlitz@tfh-berlin.de

Dipl. Informatiker (FH) Oliver Grimm
Lab Online Learning
University of Applied Sciences
Luxemburger Str. 10
D - 13353 Berlin
ogrimm@tfh-berlin.de

Dipl.-Kommunikationswirt Stefan Müller
Lab Online Learning
University of Applied Sciences
Luxemburger Str. 10
D - 13353 Berlin
smueller@tfh-berlin.de

DEVELOPMENT, EVALUATION AND DISTRIBUTION OF A HYPERMEDIA LEARNING ENVIRONMENT "PHYSICS FOR MEDICAL STUDENTS"

Heike Theyßen & Monika Hüther, Heinrich-Heine-Universität Düsseldorf

Background and aims

At the Heinrich-Heine-University of Düsseldorf the research group "Physikalische Grundpraktika" and the University and Federal State Library develop, distribute and evaluate a hypermedia learning environment in close co-operation [1]. This project, promoted by the German Research Foundation (DFG), is meant to become a model for the formation of new centres of competence where scientists work closely together with librarians on the development and distribution of hypermedia learning materials. Within the project it is evaluated, how the enlarged service of the library is accepted by the target groups (students and lecturers) and how much technical and personnel resources it demands. Another important aspect is to develop and evaluate settings for the application of the hypermedia learning environment in the context of traditional teaching offers.

The topic of the hypermedia learning environment that was chosen for this project is "Physics for medical students". There were several reasons for the choice of this particular topic:

- Medical students extremely differ in their previous knowledge in physics. A hypermedia learning environment allows the compensation of individual deficits and repetitions.
- A hypermedia learning environment is particularly suitable to illustrate the multiple interdisciplinary coherences between physics and medicine.
- Know-how concerning those coherences has already been acquired in the group "Physikalische Grundpraktika" during the development of a new labwork course in physics for medical students ([2], [3]). This can be reused as an effective preparatory work for the new development.
- Physics is a subject of the first year of medical studies. Especially this first year is characterised by a strictly determined timetable containing a lot of subjects. The occupation with a hypermedia learning environment can take place independent from timetables and allows a flexible and individual time structure.

Within this project, the group "Physikalische Grundpraktika" is particularly interested in the development and evaluation of settings for the application of the hypermedia learning environment. This comprises the comparison of the hypermedia learning environment and the traditional teaching offers concerning their influence on the learning processes of the students. The outcomes of such comparisons should indicate, in how far the hypermedia learning environment can supplement or even substitute existing teaching offers, especially labwork courses.

Therefore an additional study called "Hypermedia contra Labwork" was initiated, that exclusively deals with these comparisons. "Hypermedia contra Labwork" is a co-operation project between the group "Physikalische Grundpraktika" at the Heinrich-Heine-University of Düsseldorf and the "Institute of Chemistry Didactics" at the University of Duisburg-Essen, promoted by the "Universitätsverbund Multimedia" in North Rhine-Westphalia [4].

The following chapters of this paper present the didactical concept of the hypermedia learning environment, settings for its integration into physics education of medical students, methods for the evaluation of those settings and its results.

Structure and didactical concept of the hypermedia learning environment

The hypermedia learning environment is designed as a digital textbook with interdisciplinary, multimedia and interactive features. The content is restricted to those physical topics that are relevant for medical students. To continuously illustrate the medical relevance, the physical content is always embedded into the medical context. For example the physics of gases is explained with regard to respiration. In addition, tasks and questions are used to initiate a transfer of the physical content into the medical context by the students themselves.

The multimedia elements are computersimulations, figures and as a substantial feature Interactive Screen Experiments (ISEs). ISEs are digital (normally photographic) representations of real experiments. The user can manipulate the experimental setup on the screen using the mouse and observe the same effect as in the real experiment ([5], [6]).

To enhance the interactive occupation of the users with the content, the learning environment contains several tasks: observations and measurements have to be carried out with the ISEs or simulations, conclusions have to be drawn from the observations and measurements, calculations have to be carried out and, as mentioned above, transfer of the results into the medical context is demanded.

Input boxes for the answers and results are provided. Additional input boxes can be used for personal notes and catchwords. Any entry into an input box is stored, assigned to the user, in a database. Like in a labguide or workbook, each users' own personal entries are always on disposal for himself within the learning environment and can be revised if required. Gradual support for answering the questions is provided by tips and proposed answers. They can be retrieved on demand.

Altogether these personal entries combined with the use of ISEs allow the genuine rendition of complete labwork sessions (comprising sets of measurements, their analysis and interpretation) within the hypermedia learning environment.

The hypermedia learning environment offers a prepared learning path (red marked pages), that the students can follow in order to systematically acquire the physics related content. Further (blue marked) pages, containing the experiments, medical examples, exercises and theoretical foundations are embedded into this recommended learning path by means of hyperlinks. This structure accounts for the fact that the students' previous knowledge in physics is usually too low for a reasonable and successful self-directed navigation.

Settings for the application of the hypermedia learning environment

The development of the hypermedia learning environment is based on the previous development of a labwork course in physics for medical students ([2],[3]). The same experimental setups of the labwork course are embedded in the learning environment in the form of ISEs. The fundamental features of the didactical concept were adopted, as for instance the discussion of the medical context and the initiation of interpretation by means of questions. The selection of the physical content, its presentation and even the (experimental) tasks and questions are very similar.

Altogether, the labwork course and the hypermedia learning environment are quite similar in content and didactical concept. The differences are due to the different media:

- In contrast to the labwork course the hypermedia learning environment allows a closer and prompter linking between theory and practice. There is no artificial interruption between the experimental phase and the phase of acquiring the theoretical background.
- Technical skills which are not assumed to contribute to the understanding of physics related content can be reduced within the ISEs. Therefore more time can be spent on additional explanations, exercises or examples than in the labwork course.
- The hypermedia learning environment allows a self determined time structure. For example, a particular experiment can be repeated several times.

The similarities and differences mentioned above suggest to study whether the participation in the labwork course or the occupation with the hypermedia learning environment leads to a better understanding of the physics related content and its medical context. This comparative study is performed within two settings. The settings differ in the organisational structure in which the hypermedia learning environment is applied. The first setting allows the students maximum individuality, the second is organised very similarly to a labwork session. Both settings will be described below.

First setting: maximum individuality

Outline

The first setting is characterised by very few limiting conditions for the students' preoccupation with the hypermedia learning environment and maximum individuality in the learning process. This setting is applied in the physics education of medical students at the Heinrich-Heine-University of Düsseldorf since summer term 2001. At the beginning of term students are offered the possibility to skip one particular labwork session (out of eleven) and work through the corresponding part of the hypermedia learning environment instead. The topic of the session is the physics of gases with respiration as medical context. For those students who choose the hypermedia learning environment, only the medium and the content are predetermined. They are free to choose place and time for their occupation with the content. For instance, they can work at home or at the library, in the evening or at weekends. They are also free to choose a study group or to work on their own. Therefore support is only offered in an asynchronous manner via e-mail and within the hypermedia learning environment itself (by means of tips and proposed answers, see above).

Evaluation: acceptance and learning outcome

In summer term 2003 50 out of 275 students choose the hypermedia learning environment instead of the labwork session.

One topic of the evaluation is the question, how students accept the new method of learning compared to labwork. Another is the question why they decide to work with the hypermedia learning environment instead of participating the labwork session. These questions are surveyed by means of questionnaires among those students who have experienced both learning environments: the hypermedia learning environment and the labwork sessions. (The labwork course comprises 11 sessions and only one of those can be replaced).

The second aspect of evaluation is the comparison of the learning outcomes. As a necessary pre-condition for this comparison it is made sure in advance that the module of the hypermedia learning environment and the labwork session deal with the same content. Furthermore it is necessary to evaluate, how much both groups of students differ in the basic mathematical abilities necessary to deal with the tasks that occur in the labguide respectively the hypermedia learning environment. Finally the students' previous knowledge concerning the physics of gases and respiration has to be determined to. Therefore all students have to participate in a pre-test at the beginning of term. The pre-test comprises two parts:

- “Basics” contains 15 items (13 multiple-choice, 2 open questions) concerning the basic mathematical abilities necessary to successfully deal with the tasks in the labguide respectively the hypermedia learning environment (e.g. fractions, calculation of percentage and interpretation of diagrams).
- “Statements” contains 50 statements concerning the physics and medicine related content of the labwork session and the module of the hypermedia learning environment. For each statement the students have to decide whether it is true or false.

After the labwork session respectively the work with the hypermedia learning environment the part “Statements” is repeated (post-test) in order to determine the knowledge increase.

Results

Concerning acceptance, the survey shows that the reasons for their choice were not a general interest in computers or dislike of practical work. The most frequently named reason is the self-determined time structure the hypermedia learning environment allows for the acquiring of the content. This attitude is reflected in the subsequent appraisal of the hypermedia learning environment: according to the students point of view, the greatest advantage of the hypermedia learning environment is the self-determined time structure and the flexible choice of place and time for learning. The most frequently stated disadvantage is the missing contact to the tutors and fellow students. Despite of this disadvantage the majority of the participants appreciates the new learning method and would like to have the opportunity to replace more labwork sessions.

Although the choice of the learning method was only up to the students, the mean scores in both parts of the pretest show no significant difference between both groups called “labwork” and “hypermedia”. Therefore the comparison of the learning outcomes is possible. In the post-test (“Statements”) for each group the mean scores are significantly higher than in the pre-test, but between the groups there is no significant difference either. The conclusion from these results is, that there is no difference in the learning outcomes that are achieved with the two methods. It is assumed that the advantage of the self-determined time structure is suitable to compensate for the disadvantage of the missing personal tutoring. Nevertheless more detailed investigations on this hypothesis have to follow.

Second setting: similar to a labwork session

Outline

The second setting for the application of the hypermedia learning environment has the same organizational structure as a labwork session. It was put to the test and evaluated within an intervention study before the beginning of summer term 2003 with 50 students ([4]).

As in the first setting, one topic (physics of gases and respiration) is exemplarily chosen for the comparison. The study is performed on a specific date, i.e. time and location is determined for all participants. Students are divided into two groups. The group “Hypermedia” works with the hypermedia learning environment. The group “Labwork” takes part in the labwork session and uses the material provided by the labguide for the post-processing of the content. Both groups spent the same amount of time on working out the content. Students work together in pairs and are supposed to interact with each other. The given timeframe and the enhanced interaction substantially restrict the individual time structure. On the other hand tutors are present in both of the groups so that support is readily available. Altogether, the learning environments of the groups “Hypermedia” and “Labwork” mainly differ in the media the students work with.

Evaluation: learning efficacy

In this study evaluation is focussed on the comparison of the learning efficacy. The methods used for this comparison are pre- and post-tests and the analysis of process data.

The pre-test is very similar to the pre-test used in the first setting described above. It comprises the parts “Basics” and “Statements”. The only difference compared to the first setting is that the part “Basics” contains 2 additional multiple-choice-items.

Both parts of the pre-test are used to constitute the two groups (“Hypermedia” and “Labwork”) so that the mean score and the standard deviation are equal within each of the groups. As in the first setting the part “Statements” is additionally used to measure the knowledge increase during the intervention.

The post-test comprises three parts:

- “Statements” (as used in the pre-test)
- "Open Tasks": 4 open tasks concerning the verbalisation and application of the content treated during the intervention.

- "Concept map": a concept map concerning the content treated during the intervention has to be created; terms and relations are not provided.

All three parts of the post-test are used to determine the learning outcome. Pilot surveys yielded very low mean scores for the open tasks in the pre-test. Thus, those as well as the concept map are only used in the post-test. For the part "Statements" the knowledge increase between pre- and post-test can be evaluated.

The formative evaluation is based on the following process data:

- Videodata documenting the work of several pairs of students in each group.
- Logfiles documenting the interaction (navigation and entries) of the students with the hypermedia learning environment resp. labwork journals documenting the written answers and results of the labwork session.

The process data is analysed in a qualitative manner with regard to communication and interaction among the students concerning the physics and medicine related content.

Results

As in the first setting, the comparison of the pre- and post-test "Statements" yields a significant increase in the mean scores of both groups ("Labwork" and "Hypermedia").

The configuration of the two groups according to the results of the pre-test ensured that the comparison of their learning outcomes can be based on the post-test results. Neither the scores achieved by judging statements nor those for the open tasks show any significant difference between the two groups. Complementary to the effect assumed for the first setting, in this setting the abandonment of the individual and self determined time structure might counteract and compensate for the positive effect of personal tutoring. The analysis of the concept maps and the process data should contribute to the verification of this hypothesis.

The videodata (in the group "Hypermedia" combined with the log-file-data) are analysed with regard to the distribution of students activities among several context-categories, e.g. measurement, data processing, interpretation of data or exercises (concerning application and transfer of the physics related content). The method is derived from the CBAV-method, which was developed and applied in the EU-project "Labwork in Science Education" [7]. Every 30-seconds one category is attributed to the each students activities. First results show, that the group "Hypermedia" spends significantly less time on measurement than the group "labwork", but significantly more time on processing exercises. The amount of time spent on the interpretation of their own results is on average equal for both groups. The students' verbalisations will be analysed in a similar manner with regard to the question, which domain they refer to, e.g. organisation, technical details of the experiments, physics or medicine related content.

The concept maps are analysed in a qualitative manner. At first the terms and relations produced by the students are converted to statements. In the next step those statements are categorised according to the domain they refer to and according to their quality. Results from this analysis are still outstanding.

Conclusions and perspectives

The evaluation of the application of the hypermedia learning environment shows a predominantly positive attitude among the students towards this new learning medium and method. The analysis of the tests yields no significant differences in the learning outcomes achieved during a labwork session respectively during the work with the hypermedia learning environment - no matter which of the contradictory demands for personal tutoring and individual time structure is realised.

Next steps in the evaluation and distribution of the hypermedia learning environment are:

- Further and more detailed evaluation of the two settings described above (respectively completion of the data analysis for the second setting).
- Application and evaluation of the hypermedia learning environment within further settings, e.g. in the context of lectures and seminars.
- Transfer of the hypermedia learning environment to other universities and distribution to a larger group of users.

The last aspect is in the focus of the final stage of the project and of special interest for the library participating in the project. Furthermore, the transfer to other universities implies the possibility of testing further settings. From winter term 2003/2004 on the hypermedia learning environment will be introduced at several other universities.

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Authors

Dr. Heike Theyßen
Monika Hüther
Physikalische Grundpraktika, Heinrich-Heine-Universität Düsseldorf
Universitätsstraße 1
D-40225 Düsseldorf
Germany
theyssen@uni-duesseldorf.de
huetherm@uni-duesseldorf.de

DOES A NORDIC-BALTIC APPROACH TO ODL EXIST?

Joergen Bang, Aarhus University

Why ask the question?

An ongoing project named BOLDIC builds on the assumption that a Nordic-Baltic approach to open and distance learning exists, but that it needs to be catalogued before it disappears.

In the successful application to the SOCRATES-MINERVA programme in 2001/02 the background for the project was outlined in the follow way:

Because of narrow market in small countries and many national languages a unique pedagogical traditions are in danger of being taken over by tendencies of unification and dominance of traditions coming from countries outside the BOLDIC region.

This threat to the regional development of ODL was probably felt more strongly in 2000/01 when the project idea was conceptualised among the national associations for open and distance learning in the 4 Nordic and 3 Baltic countries, than it is today. At that time focus was on e-learning understood as resource-based learning with a minimum of student support, whereas today the focus has changed to a blended approach. This was clearly expressed by Commissioner Reding in her opening speech for the LEARNTEC Conference in Karlsruhe on February 4th, 2003:

Modern e-learning solutions now recognise the importance of learning as a social process and offer possibilities for collaboration with other learners, for interaction with the learning content and for guidance from teachers, trainers and tutors. The learner-centric approaches have put the learner back in command, with a wealth of learning resources at their fingertips.

Teachers and trainers once more play a central role, using virtual and traditional face-to-face interaction with their students in a 'blended' approach. An approach in which they are no longer seen simply as consumers of pre-determined e-learning content, but as editors, authors and contributors to a contextualised learning scenario.

Although the pressure on the students-centred approach to ODL in the Nordic and Baltic countries seems to have declined there are still good reasons to explore the Nordic-Baltic tradition in ODL. Does it exist? What are the major characteristics? Is it unique Nordic-Baltic? Is it possible to identify a dominating and accepted understanding of learning?

Mountains divide, waters unite

The countries around the Baltic Sea have different national cultures including languages. They also have different national histories but at the same time histories that are interconnected and dependent on each other and on external forces. For the last 1000 years there has been trade and wars, exchange of ideas and conflicts of interest between all the countries in the region. Nevertheless the last 100 years have primarily been dominated by collaboration to the extent this has been possible with the Soviet Union as a regional neighbour.

In the 1920's the 3 Baltic States got inspiration to create their new national educational systems from the Nordic countries. In the 1990's when they regained their independence from the Soviet Union, they returned to the former educational system and renewed it by inspiration from across the Baltic Sea.

The renewal of distance education was also done in collaboration with the Nordic countries. During the late 1980's several Nordic institutions experimented with implementation of ICT into their ODL concepts of blended learning. Key Nordic persons such as John Bååth, Börje Holmberg, Torsten

Rekkedal, Morten Flate Paulsen and Soren Nipper even participated in the international discussion on how to reframe distance learning to the challenge in the light of IT opportunities. In 1993 these Nordic experiences were forwarded to the Baltic countries in a feasibility study on Distance Education in Estonia, Latvia and Lithuania carried out by support from the Nordic Council of Ministers. Teams of experts from Nordic and Baltic countries made national reports and summed up the investigations with some general conclusions and recommendations:

The aim of modern distance education is to offer the students adequate opportunities to study, independently of time and space. The study material must be self-instructive and of high quality. The underlying methodology of distance education courses must take into consideration the need for dialogue between teacher and student and students themselves when this is necessary.

(...)

Dual-mode institutions have a possibility of shifting their courses between classroom teaching and distance education in a relatively flexible manner. The investments needed for a transformation of regular courses into the distance education mode are relatively speaking smaller than in single-mode institutions and course adaptation to knowledge is smoother and faster.

The follow-up on this feasibility study took place within the PHARE multi-country programme financed in the latter part of the 1990's by the European Commission. Similar to the Nordic countries and in accordance with the other PHARE countries the Baltic countries developed ODL within a dual-mode model.

The Nordic-Baltic Approach to ODL

During 2003 the national associations of institutions offering open and distance learning courses in the Nordic and Baltic countries have identified national experts in ODL, asked them to name examples of good ODL praxis and synthesised the information into national reports on ODL teaching praxis.

The following is an attempt to identify the central specificities of a Nordic-Baltic approach on the basis of these national reports. All specificities are to some extent shared by the countries, but there are differences in emphasis. The specificities can be classified in five central concepts: *student-centred*, *communication*, *collaboration*, *active participation* and *face-to-face*. The concepts are interrelated, but they stress different aspects of importance to the identity of the Nordic-Baltic approach to ODL.

Firstly, all countries express a *student-centred* approach. This is a fundamental characteristic and the following aspects can all be seen as integral parts of the specific Nordic-Baltic student-centred approach. The student-centred approach includes concepts such as openness and freedom, which is in opposition to discipline and teacher-controlled courses. The Estonian report (p. 12) states that: "Increasing numbers of instructors are experimenting with student-centred learning approaches and constructivist models of learning." Sweden specifies its approach as problem-based and pupil-oriented. Lithuania describes the pedagogy used as child-centred, but at the same time a tendency within distance learning is described as moving towards *self-dependent* learning.

Secondly, there is the aspect of *communication* in the form of dialogue, conversations or discussions. This seems to be an all-important element of the Danish approach to ODL, and also Sweden places great emphasis on communication and discussions. Openness in the form of communication, collaboration and creativity is also described as a central aspect of Lithuanian pedagogy.

Thirdly, there is the aspect of *collaboration* between students. Group work or teamwork is mostly a Swedish, Norwegian and Danish phenomenon. Especially Norway views collaborative group work as central and they place importance on the social factors in education. In accordance with a student-centred approach, the Danish report describes a form of group work (problem based group work) where students decide what to work with and how.

Fourthly, there is the aspect of students' *active participation* which is expressed in terms such as learning by doing and experimental learning. Especially Finland focuses on engaging students in the learning process, and they are particularly concerned with the problems involved in student participation at a distance: "It is not too difficult to present information over a distance, but getting people to participate and making learning active at a distance is much harder." (p. 14). The Estonian report places emphasis on the active engagement of students, and also Latvia focuses on this aspect, emphasising that students learn themselves.

Fifthly, there is the aspect of *face-to-face* meetings between students and teachers, which is concerned with the synchronous presence of people. All countries explicitly stress the importance of face-to-face meetings as a part of ODL courses. In recent years, particularly Latvia and Estonia have increased their focus on face-to-face meetings, making it an all-important ingredient of ODL. The Latvian report (p. 11) reads: "Feedback and face-to-face study support in groups and for individuals was mentioned by many experts as a very important factor of good practice."

These aspects of the Nordic-Baltic approach to ODL manifest themselves in certain methods used in the organisation of ODL courses. A suitable name for the basic elements of a common Nordic-Baltic method is: *a blended approach*. The national reports clearly suggest that the structure of ODL in all countries is moving towards a mix of distance learning and personal meetings. The Swedish report (p. 16) reads: "In all ODL in Sweden there is a commonly agreed need for a mix of distance learning methods and personal meetings between students and teachers/tutors." The Norwegian report (p. 14) states: "Most of the courses combine physical meetings and distance teaching ("mixed mode courses")." The Danish report (p. 18) shows the same tendency: "Independent of which educational level they represent most experts in this survey agree that the best results of ODL are achieved by combining classroom based teaching and distance education." The blended approach could take form of a course based on face-to-face meetings (for example seminars) followed by independent student work where the students collaborate in groups and use the web as a platform for conversations and discussions. This blended approach may be characterised as *the Nordic-Baltic approach*.

The Nordic-Baltic-ness in ODL

Although concepts of openness and learner-centricness imbedded in a blended teaching mode are identified in the Nordic-Baltic approach to ODL, the questions still remain: to what extent are these approaches Nordic or Baltic – not to say Nordic-Baltic – in their origin? What is their background? Do the approaches express a certain view of the human nature or a certain understanding of learning? Let me try to answer the questions within the frameworks of pedagogical thinking and learning theory.

The progressive movement in education

In the 20th century the main influence on pedagogy and education has come from the new raising academic fields of psychology and sociology. Early in the century the established pedagogical tradition was based on strict discipline and an authoritarian teacher. The child was viewed as a kind of raw material that needed to be educated; to be moulded to fit the norms of society.

The emerging psychology provided a different approach – e.g. Sigmund Freud warned against suppression of the child's natural instincts and impulses. Instead, the development of the child's inner nature should be promoted. In the same years schools of sociologists advocated respect for the individual and stressed the importance of bringing up critical, reflective and democratic individuals – e.g. the Frankfurter School founded in the 1920s. This radical movement is often referred to as "cultural radicalism". The combination of cultural radicalism and psychology led to a progressive pedagogical movement.

The progressive movement believed that traditional pedagogy supported education of passive children, while the goal of progressive education was to humanise education. The progressive movement was an international movement, and in 1921 the international New Educational Fellowship was founded. Before the Second World War schools (often on private initiative) were established to promote the

new pedagogical approach to education. These schools did not become prototypes for the public schools in the years to come, but the methods developed did influence the pedagogy in public schools.

To a large extent cultural radicalism dominates the pedagogical discussion even today, and, certainly, has influenced the pedagogical development - at least in the Nordic countries - during the last fifty years. Therefore, this framework of thinking may help to explain the Nordic-Baltic approach to ODL. The fundamental factor is the concept of a *child-centred* approach. The key words describing the tradition are antiauthoritarian, autonomy, independence, freedom, respect for the individual, individual-centred, democracy, focus on the child's interests and needs, criticism, reflection, inner nature, activity, self development, constructive dialogue, conversation, communication, development of responsibility and ability to make decisions.

The progressive movement does, primarily, reflect sympathy towards a certain view of human nature, which is transformed into pedagogical principles and methods that are not explicitly based on a learning theory. This does, however, not mean that learning theories have no influence (see below). Furthermore, the movement is, to a large extent, formed on the basis of what it is *not*. It expresses scepticism towards the existing society and is in opposition to discipline, external control, punishment, authority etc.

The view on human nature offers – to some extent - an explanation of the Nordic-Baltic approach to ODL. The *student-centred* aspect of the Nordic-Baltic approach relates to keywords such as child-centred, autonomy, independence, freedom, democracy and respect for the individual. The *communicative* aspect is related to dialogue, conversation and communication. *Collaboration* relates to the development of responsibility and the ability to make decisions. The aspect of *active participation* relates to self-development from an inner nature and self-activity. Finally, the aspect of *face-to-face* can be related to keywords such as dialogue, conversation and communication. There seem to exist a congruity between the student-centred Nordic-Baltic approach and the description of the child-centred view founded in the first half of the 20th century. The key words representing the progressive movement could be important predecessors of the Nordic-Baltic approach. In other words, it is - to some extent - possible to explain the approach on the basis of a certain view of the human nature, but that does not make it Nordic or Baltic in origin.

Knowledge transfer or knowledge building

The same complexity occurs when analysing the learning theories implicitly or explicitly present in the Nordic-Baltic approach to ODL. A rough simplification may divide the learning theories in the 20th century into two trends – well knowing that each trend incorporates learning theories, which are incompatible with each other. Within theories of behaviourism and cognitivism and within Howard Gardner's theory of multiple intelligences knowledge is viewed as direct transferable from one person to another through teaching. Whereas within theories of pragmatism (Dewey), radical and social constructivism (Piaget, Glaserfeld, Luhmann), activity theory (Vygotsky, Leontjev, Engeström) and situated learning (Lave, Wenger) knowledge acquisition is viewed as a process of construction in which the learner is the active part. Applying this rough separation between “knowledge transfer” and “knowledge construction” in the analysis of the Nordic-Baltic approach to ODL helps to understand the range of the approach.

The concept of *student-centred* is important to the Nordic-Baltic approach. All the constructivistic theories implicate a student-centred approach, but also within cognitivism the learning process should respect each student's cognitive abilities. In the Nordic and Baltic countries the importance of openness and freedom are stressed in opposition to teacher control. This indicates an organisation of flexible course activities where students work independently. In this respect, the Nordic-Baltic concept primarily reflects a constructivistic idea of student-centred. But concepts such as problem-based, project-oriented or goal-oriented are, however, not included in the over-all Nordic-Baltic approach.

The aspect of *communication* has different meanings within the two trends. In the form of lectures communication is, primarily, understood as knowledge transfer. One-way communication supports teacher instruction and transfer of a fixed curriculum to the student. However, the Nordic-Baltic

approach does not seem to emphasise this idea of communication, but stresses the importance of communication in the form of dialogue, conversation and discussions. This emphasis also suggests an equal relationship between teacher and students – and this, again, primarily implies a constructivistic approach.

The third aspect of the Nordic-Baltic approach is *collaboration*, which also has different meanings. *Collaboration* in the form of group work or teamwork in which students depend on each other and work together on a common assignment is, primarily, a constructivistic approach, although collaboration is not directly excluded within cognitivistic thinking. The key issue is determining the character of the group work.

The aspect of *active participation* can also be interpreted in different ways. Activity in the form of learning by doing and physical experiments is acknowledged both within cognitivism and constructivism. Especially social constructivism and Gardner's multiple intelligence theory emphasise the importance of physical activity. Central to both these approaches is also the creation of products. However, the terms *active participation* and *active engagement* as mentioned in the national reports, are connected with cooperation and collaboration. They indicate a kind of group work, which primarily relates to the constructivistic idea of an active student.

The aspect of *face-to-face* is very concrete, but at the same time not very precise. On the one hand the aspect could be motivated by the socialisation of the students. On the other hand it could also reflect a belief that face-to-face meetings are necessary in order to secure a common understanding among a group of students. In relation to the blended learning approach, face-to-face meetings are used as a starting point. A group of students discuss the subject matter, reach a common understanding, and formulate a problem. Thereafter the students collaborate separated from each other.

The learning theoretical framework shows that it is possible to interpret the specificities of the Nordic-Baltic approach to ODL in different ways. The different interpretations make it difficult to draw an unambiguous conclusion regarding the learning theoretical position of the Nordic-Baltic approach, but, mainly, it seems to support the idea of “knowledge construction”, although “knowledge transfer” cannot be totally disregarded.

Answering the initial question

In the Nordic-Baltic approach to ODL the five concepts: *student-centred*, *communication*, *collaboration*, *active participation* and *face-to-face* are closely integrated with what is often called 3^d generation approach to ODL. If the 1st generation is correspondence education and the 2^d generation the industrial ODL model supported by radio and television, the 3^d generation is distance education for smaller groups supported by ICT to enhance dialogue between teacher and learner and among the learners themselves. The focus on dialogue, small-scale operations (in which course authors and tutors often are the same persons), integration of face-to-face seminars into a blended model and – last but not least - the fact that institutions offering ODL in the Nordic-Baltic region are dual mode institutions reflecting the general change within universities, seem to be what have generated the Nordic-Baltic approach to ODL.

The trends to this approach come from e-learning concepts such as “just-in-time-learning” and “just-in-place-learning” (resource-based learning), which deliberately avoid dialogue, collaboration and coaching in order to be cost-effective. In training and instruction programmes these concepts are efficient and should be further developed. But to educate citizens for the knowledge society a critical and analytical conscience is essential. Therefore, in addition to training and instruction education need to be understood as a social activity with collaboration and interaction among learners.

Let me finish by summarising an answer to the initial question: *Does a Nordic-Baltic approach to ODL exist?* Yes, the Nordic and Baltic countries share - at the level of teaching praxis - a general approach to ODL referring to the same basic understanding of human nature and the learning process. But this approach is neither Nordic nor Baltic in its origin and it does not constitute an elaborated or a consistent unambiguous theoretical framework. However, the identified approach expresses a shared

vision between the Nordic and the Baltic countries - a vision that may form the basis for future collaboration and further development of the Nordic-Baltic pedagogical approach to ODL.

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Author

Associate Professor Joergen Bang
Aarhus University, Department of Information and Media Studies
Helsingforsgade 14, DK-8200 Aarhus N, Denmark
jbang@imv.au.dk

ONLINE LEARNING AND TUTOR SUPPORT

*Danguole Rutkauskiene, Airina Volungeviciene & Vilma Ruta Kovertaite,
Kaunas University of Technology*

Challenge of Using ICT

The use of Information Communication Technologies (ICT) has become not only the requirement of our prosper present, but it has proved to be our every day's necessity and obligatory tool of our work, of our leisure time and the requirement for our safe and provided future. Open and Distance Learning (ODL) reflects the ideological changes in higher education, and therefore new international policies are designed at higher education institutions.

Digital competency is being defined as a new main skill which is necessary for an individual's active participation in the knowledge economy. The lack of digital competency is considered to be one of the main reasons for a high level of unemployment in certain regions, certain industry areas and also among socially disadvantaged groups [1]. Institutions of higher education promote the development of their staff competencies in application of digital tools.

It is the common truth that education is the leading force of positive changes of humanity. Learning and training process participants embody the great power to influence the very positive changes in human attitude. All of us would agree that the attitude is among the most important factors in educational reform, however, alongside with other ones, when inner and external motivation, together with enthusiasm and willingness play major roles. "...Beliefs and values are not minor, they are fundamental. They provide the submerged "bulk of iceberg" upon which any particular technique rests." [2].

Lithuania, together with other countries, faces the challenge of using ICT in the process of education. Though our country is taking its steps behind the leaders in this sphere, we are making our progress day by day, year by year. We also acknowledge the fact that the access to information plays one of the most important roles in motivating adult educators to accept decisions and to start making changes in their ways of tutoring. Insufficient skills and fear to gain the required skills because of the lack of information, expensive internet connection causing restrains to have a PC with internet connection at their private places, as well as the lack of self-confidence result in their negative attitudes towards changes in their working methods.

Computer and Internet usage

The ICT sector is one of the most rapidly growing sectors in Lithuania. However, despite the rapid rate of growth, Lithuania is far behind the EU, as well as other Baltic states in this sector.

According to the data of the household budget analysis carried out by the department of Statistics, in January – September, 2000, a Personal Computer was owned by 5% of the households, and it reached 9 % in 2001. 43% of the households possessing a PC used Internet and Email, in 2001, (in the five major cities almost half of the households use these services, in the country every fifth household analysed) [3].

In 2002, 11,8 per cent of all households were equipped with a PC. And we find the statistical data in the press now that 19 % of Lithuanian citizen are already internet users in 2003 [4].

Surveys show that the main reason why Lithuanian people having computers do not use Internet is limited financial capacity (almost half of the households who have no connection to the Internet say that the reason for this is a high subscription cost and the usage tariff, while others have identified other reasons, i.e. limited technical possibilities of their computers, limited skills and other reasons).

	Lithuania	EU average
Constant internet users compared with the number of population, %	11,3	35,0
Households equipped with PC compared with total number of households, %	9,0	36,1
ICT and related students compared with the total number of students, %	5,3	4,0
Internet users purchasing on the internet compared with the total number of internet users, %	3,0	44,0
The number of computers per 100 schoolchildren	2,5	8,6
The number of computers per 100 residents	7,1	30,4
The number of internet users per 100 residents	6,8	31,4

Table 1: The Use of ICT in Lithuania and EU in 2001 [5].

In Lithuania the Internet is mainly used by the young population; the main groups of users are company leaders, students and specialists; internet users live in big cities, they have higher education diplomas, comparatively high income and social status. This means that at the moment the Internet in Lithuania is accessible to a rather limited group and the involvement of the rest of the population in the Internet usage is low.

The words “digital divide” inspire our common efforts to fight digital illiteracy in our countries. For the successful implementation of EU strategies, Lithuania, as a Candidate Country, first of all, has to tackle a significant problem, i.e., low digital competence of the population.

The EU action plan “eEurope+ 2003: an Information Society for All” also foresees that in 2005 Europe is going to have modern online public services with dynamic business environment, universal access and a reasonable price. Thus ICT learning needs for SMEs (Small and Medium Business Enterprises), especially in remote areas is a serious challenge for universities and other education institutions. Online learning may constitute very effective tools for integrating SMEs, especially in remote areas, into the new economy and enable their staff to benefit from the professional development.

As an example of the response to this EU strategy, a package of six online courses together with the video material and methodological guidebook for office ergonomics could be mentioned here, that were developed during EU Leonardo da Vinci project “IT-Academy: E-Learning for SMEs” (<http://www.smelearning.net>). Partners from Lithuania, Estonia, Latvia, Sweden, United Kingdom and Switzerland (a silent partner) contributed to the development of such online courses for SMEs staff, as “Information Literacy for SMEs” (pre-requisite for the other courses), “Computer Based Project Management”, “IT in Management and Business Administration of SMEs”, “Use of IT in Management of Human Resources”, “Self-Marketing through IT” and “Information Technology Networks”. Staff members of SMEs will not have to leave their working places to gain new or improve their existing competencies – they will have the opportunity to learn at where they are, and their employers will save time and money.

However, such type of e-learning requires support, which should be provided by professional mentors. The reality proves that those mentors should first of all be the staff members of education institutions. Universities, distance learning centres, business support centres and other training institutions should first of all educate their trainers and other staff members to be able to develop flexible and adaptive learning environments to cater for individual learner needs. All individual factors (socio, economic and educational, as well as other) should be observed while designing and delivering online learning, as well as user possibilities to receive and transmit the learning message.

ICT in higher education

European Universities participated in the survey funded by EU programmes, and 13,000 students responded to surveys and interviews during a 30 month study. The results showed that when students

were asked about their confidence in using ICT, most students at all universities responded that they were either “very confident” or “were looking for the challenge” of using ICT in their studies [6]. The great majority of the new students viewed ICT as being “very important” or “important” for their future career and almost no students indicated that it would be of “little importance or no importance”. The respondents indicated that the frequency of using ICT in their studies varies from 5% to 20 % (the highest rate). In general, most new students (72%) thought that they would use ICT in their studies daily or at least several times per week. This survey was performed before the new students were actually enrolled in university programmes and their courses; therefore, they were predicting ICT usage.

ODL at Kaunas University of Technology (KUT)

ICT became a powerful tool for higher education institutions, for teachers and researchers, as well as for correspondent students and traditional studies. ICT usage not only improved the access to science and training, but also the quality of the content delivered. Up to now, the training based on ICT, delivered in Lithuania, seemed intimidating and replacing traditional studies, and not many thought about the possibilities it provides.

On the basis of the research made in Europe, the four main priorities of the actions have been set: infrastructure and equipment, e-learning and support, contents of good quality and services, as well as the platform of the European Collaboration, as well as on the ground of recommendations developed by e-Study Board at KUT, the following guidelines for the development of e-studies are set at KUT:

- to use ICT as a learning tool more effectively,
- to encourage application of e-studies elements in delivering traditional study modules, to stimulate individual work, to develop ICT teacher skills gradually and to prepare them to design and to deliver their e-modules,
- to encourage development of e-modules and adaptation of existing modules for e-studies,
- to motivate university staff to develop e-study programmes,
- to coordinate e-studies with the programmes of continuing education,
- to encourage preparation of separate e-modules and complete e-study programmes.

It is necessary to encourage scientific research in the future by analysing and developing new training modules, by applying ICT in the development of learning skills, educational tools focused on the learner, as well as ICT social affect. Only by the development of the subjects of interdisciplinary research, we could implement the vision of e-university. The most important objectives for the nearest future have been identified for the implementation of this vision.

Student and Tutor Support Systems in Online Learning

As it was mentioned before, the development of tutor – student support system is one of the most important factors for the successful elaboration of e-learning. The important issue in university staff training is that though not all university staff members use ICT in their lecturing, the majority of them use ICT in preparing their lectures. As ICT is a key tool of management and sharing of knowledge among academics, it is part of backbone of our competence [7]. The whole process of e-learning could be described by the following functions:

- Learning. It should be integrated into the learning process.
- Tutor support. It should be designed to support the learning process.
- Technical support. It should ensure the quality of communication among all participants of teaching – learning process by using technical means.
- Administration. It is meant to implement and fulfil formal ODL requirements.

- Managing. This is to find the customers for teaching- learning process and to form a team which will provide the courses.
- Teaching/ Tutoring. By which we will ensure that the delivery process will be focused in the subject structure.
- Content author/ deliverer who will develop and form the ODL course.

To ensure the learner support, the tutor, the ODL deliverer should perform the following functions:

- To determine his/her role in support providing for students and to motivate them for learning.
- To determine the ways how to help students to coordinate their own development at different stages of their learning.
- To determine the real aims and to deliver them for their students, as well as to present practical methods and ways to reach these aims.
- To coordinate their activity to reach the determined aims.

Tutor Training

During the process of modernisation of teacher skills' development process, a management system has been created at KUT, which provides the possibility to use the existing ICT and human resources most effectively. Distance Education Centre (DEC) (<http://distance.ktu.lt>) at KUT is responsible for development of ICT skills in e-learning among university teachers.

DEC also prepares methodological material on certain subjects and organises trainings. The same courses are also delivered for teachers and trainers from other Lithuanian higher education institutions and colleges, as well as NGOs and adult training organisations.

Teachers are trained using various training methods: *face-to-face*, training in a distance or combined or mixed types of training. The Curriculum is put on the server, lectures and consultations are delivered via videoconferences, by applying Lithuanian DE (LieDM) network <http://www.liedm.lt>, or in any other way, over e-mail or over the phone.

In accordance with LieDM project, a **videoconference support system** was developed to organize an interactive videoconference. The main purpose of this software is to facilitate the interaction between a teacher and students during a videoconference. Students sitting in remote classes get connected to the videoconference support system, follow the lecture, send their questions to the teacher, communicate among themselves, and follow teachers' instructions. The teacher can do the following things:

- Monitor the audience,
- Control the learning environment,
- Show the slides prepared in advance,
- Ask short Yes/No questions,
- Prepare quick tests, make quiz, watch the results,
- Answer students' questions sent to the frequently asked questions database,
- Watch students' discussion in a chart window.

We are happy to acknowledge that positive changes in tutors' attitudes towards e-learning, as well as in their methods of subject delivery, have been noticed in Lithuanian universities. We can acknowledge this as Distance Education Centre at KUT was among the first institutions which contributed to tutor training in Lithuania. The Centre started delivering tutor training to teachers of various Lithuanian universities, institutions of higher education and to trainers from other adult education centres in 1999. The first courses delivered to tutors to develop their ODL competencies were "The Basics of ODL Methodology", where teachers from education institutions were taught how

to develop their courses in ODL environments, two courses on virtual learning environments, namely “The Basics of LUVIT” and “The Basics of WebCT”, “The Basics of HTML”, “INFORA: MS Office and Professional Skills”, and other courses.

Taking a glimpse at how popular the mentioned courses were among university teachers, we discover the following statistics:

The Year	Title of The Course	The Number of Participants
2001	WEBCT	38
	LUVIT	23
	INFORA	54
2002	WEBCT	67
	INFORA	48
	CDK	55
2003	WEBCT	25
	CDK	155

TABLE 2: The Courses on ODL Methodology Offered at DEC at KUT

The greatest number of teachers eagerly attended the courses on e-learning methodology at the Centre during the period from 2001 up to the first half of the year 2003. In 2001, the greatest number of teachers completed the course “The Basics of ODL Methodology”. The teachers have acquired the knowledge on how to prepare their traditional courses according to ODL methodology, how to ensure their quality and evaluation.

Another course, “The Basics of WebCT” was the most popular course in 2002, as the majority of teachers, who were familiar with the basics of ODL methodology, and who now were eager to get acknowledged with virtual learning environments, chose this course and successfully completed it receiving a certification. They were presented with this popular learning environment, with the methods how to put their courses on-line and how to deliver them and monitor and motivate their students.

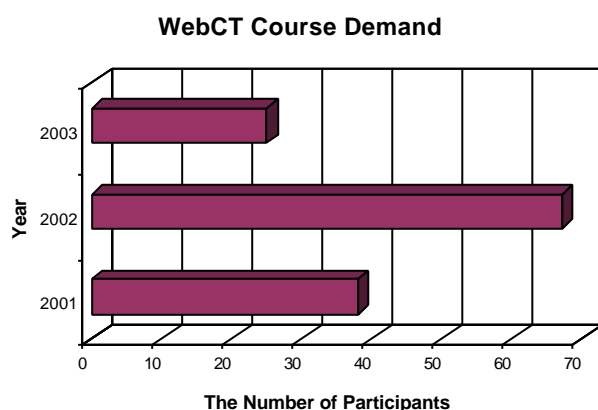


Table 3: WebCT course demand in the period from 2001 up to July 2003.

Among other courses on e-learning, a new course was developed at Distance Education Centre, in 2002, presenting one more way to the university teachers how to transform their traditional university courses to on-line courses. A new Course Development Kit has been developed, called CDK. The course became of great demand among teachers, and equal number of learners participated in this course during the year 2002 and during the first half of the year 2003, which proves the rising demand for such tools and training in this field:

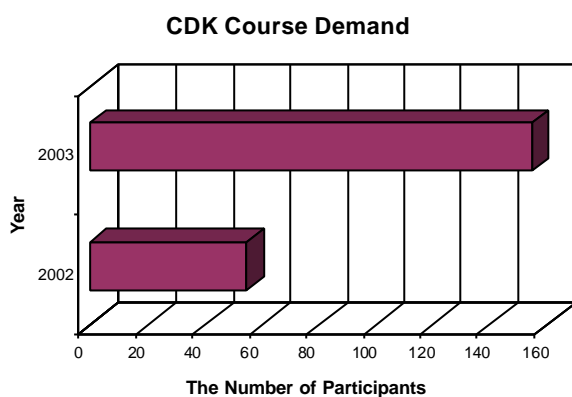


Table 4: CDK course demand in the period from 2001 up to July 2003.

We could be proud of the fact that the majority of university teachers who successfully completed the courses up to now contact the centre to get any kind of technical or methodological support. We can proudly recognize the Centre's pioneer work while browsing among the suggested ODL courses in CDK, WebCT, or other virtual learning environment.

The numbers prove the successful implementation of tutor training activity at the centre. Positive changes in e-learning at KUT were clearly identified, and, therefore, new challenges were faced to improve skills and tutor training at Distance Education Centre.

The evidence of our strong wish for improving of our competencies in Online learning delivery and tutor support is our studies at Universite de Liege. 6 staff members from our centre are enrolled in ODL Master programme at Form@sup Laboratory at Universite de Liege to develop their own online courses. We are happy to have a chance to learn to work according to methodology by professor D.Leclercq, M.Poumay and other Labset staff members (http://www.ulg.ac.be/labset/des_formasup/Pages/r_ead_ang.htm), and to respectively apply our knowledge, new skills, and new competences in our daily work.

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Authors:

Danguole Rutkauskiene, Airina Volungeviciene & Vilma Ruta Kovertaite
 Distance Education Centre at Kaunas University of Technology
 Studentu str. 48a-308, LT - 51367
 Kaunas
 Lithuania

THE TOOL FOR SUPPORTING ODL ACTORS IN TRANSITION OF LEARNING CULTURE

Audrone Valiuskeviciute, Giedra Linkaityte & Lineta Zilinskaite, Vytautas Magnus University

Rationale for developing the tool

Information Technology (IT) in education is one of the main issues of discussions of Information Societies. The idea of a Knowledge Society allows for the refocusing of attention from educating to learning, from traditional schooling to the development of learning possibilities in everyday life, and from the application of IT in education to open and flexible learning. Each new historical stage in the development of a society and learning culture rests on previous stages and opens new learning perspectives and elements from previous developmental stages that can be found in latest stages. Educational theorists define transition of a learning culture by pointing out some principal changes in the concepts of knowledge, teaching and learning, in the ownership of learning objectives and in the roles of teachers and students. All participators in the field of open and distant learning (ODL) face not only rapid change of IT, but changes within the learning culture as well and therefore, it is time to reflect on ODL practices, in the context of these changes. Theoretical framework is needed for support of this reflection and the identification of pedagogical bases of ODL practices.

Coomey and Stephenson (2001) suggest a model of four teaching-learning paradigms. The four paradigms are distinguished by combining two distinctions, i.e. control of learning (teacher controlled versus learner managed) and task specification (specified tasks versus open-ended and strategic tasks). The North West segment of the model (NW) represents instructor-led and often text-based instruction. The South East segment (SE) represents self-directed and collaborative learning. Transition of the learning culture is conceptualized as a diagonal shift in the model (from the NW to the SE segment). Two other paradigms: learner-controlled learning of specific tasks is defined by a teacher (the NE segment) and resource and discussion-based, while instructor-mediated learning (the SE segment) can be considered as intermediate states in transition. The four teaching-learning paradigms can be interpreted as four learning perspectives, which could be intentionally chosen by an ODL participator. This model creates the methodological background for the development of the tool that can be used for the identification of tendencies within the pedagogical practices.

The theoretical frame of the tool

The tool is based on a pedagogical based model of the ODL practice (see Fig.1). The model consists of three levels: the main pedagogical conceptions as the top level, learning objectives at the intermediate level and teaching-learning actions at the lower level. The three main concepts: concepts of knowledge, teaching and learning that are built up the conceptual bases of the ODL practice. Observable activities are defined as the performance of tasks and exercises, distinction of teacher's and student's roles and types of assessments and evaluations. All the seven elements in the model are interrelated, so, the identification of one or more, which allows for formulating assumptions about the remaining elements. Transition of a learning culture supposes the coordinated change of all seven elements. The seven elements in the model are defined on the basis of different educational theories.

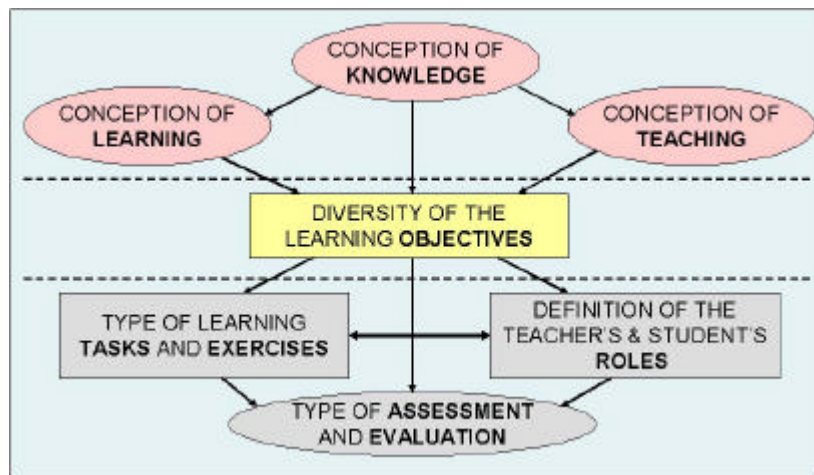


Fig.1 The pedagogically based model of the ODL practice

The concept of knowledge is a complex one and different theories emphasise different aspects. The authors suggest four aspects to exploring the **concept of knowledge** :

- Nature of knowledge: Does knowledge exist before a learning experience? Do we think about the transfer of content packages or about the construction of knowledge in the learning process? Wilson (1996) discusses knowledge typology, which illustrates a shift from disseminative to constructionist conception of knowledge in the context of transition of learning culture.
- Ways of legitimizing knowledge: Sheffler (1965) suggests a theory of three ways for legitimizing knowledge: a) the rationalist way, where knowledge is legitimized by reasoning; logic is one of the main argument for trusting knowledge; b) the empirical way, where knowledge is legitimized by contrasting it with reality; and c) the pragmatist way, where the main argument for validity of the knowledge is the fact, whether it works in practice or not. The value of the pragmatist way increases in contemporary learning practice.
- Dichotomy of theoretical and practical knowledge (Jarvis, 1991): Is it information or personal experience that serves as the main source of knowledge? Experiential learning as a source of practical knowledge becomes the first priority in relation to studies away from academic studies and as a transition to ODL.
- Constitution of knowledge: Jarvis (1991) introduces three types of practical knowledge: content knowledge, process knowledge and values and beliefs. All these have their conscious and tacit dimensions. An ODL participator can stress any type of knowledge, and this in turn depends on the learning objectives.

A teacher and a learner bring understanding of knowledge from previous experience into new learning situations, which can be built on different conceptions of knowledge. In addition, reflection on and coordination of conceptions of knowledge becomes a key to success in the knowledge building process.

Learning theories explore the diversity of **learning conceptions** (Marton, Beaty and Dall'Alba, 1993; Karjalainen and Niemi, 2000). Learning can be perceived differently in different learning cultures. It can be perceived as the process of: the quantitative increase of knowledge; remembering/recall; acquisition of facts, methods and tools for practical use; meaning extraction; interpretation, which is directed to the understanding of reality; social interaction; enculturation and adaptation to a group's ways of thinking and activities; and/or personal and/or professional development. Learning and knowledge conceptions depend on each other, i.e. the perception of learning as a quantitative increase of knowledge and as remembering/recall indicates the paradigm of traditional teaching and the dominant disseminative conception of knowledge. The perception of learning as interpretation and as social interaction characterizes the paradigm of open learning and constructivist conception of knowledge.

The conception of learning is closely related to the **conception of teaching**. Ramsden (1992) suggests that teaching can be perceived in three ways: as a transmission of information, as organizing or as

enabling a students' learning. These three conceptions of teaching form the basis of three teaching orientations: subject orientation, teaching/learning method orientation and learning environment orientation. The first orientation can be related to the paradigm of traditional teaching, whereas the third one is close to the paradigm of open learning.

The main characteristic of open learning is openness to the diversity of students, who raise different **learning aims, goals and objectives**. Beatly, Gibbs and Morgan (1997) distinguish four learning orientations: professional, academic, personal and social orientation. These orientations set the frame for setting learning objectives. Course creators, teachers and tutors delegate control of learning and share the responsibility of setting objectives with students in the paradigm of open learning. Supporting awareness of all these participators to their learning objectives and the coordination of objectives between them lead to the quality of learning and teaching.

The type of **learning tasks and exercises** will differ depending on the leading conceptions of knowledge, learning and teaching and the frame of objectives that are pre-set for that learning course. These tasks and exercises can vary from specific to open-ended ones, from closed to open questions and from a task inside a narrow subject or a thematic area to a multi-disciplinary project work. The task can be directed to the reproduction of the content or it can encourage creative expression. The tasks and exercises can be the same for the whole student group or individualized, according to different learning objectives, abilities and learning styles. Tasks and exercises can be characterized by orientating to a predefined result or to an open-ended process. Some tasks require dealing with abstract concepts or theories, whereas others orient students towards reality. Some tasks encourage active exploration and experimentation, and others support reflection on gained learning experience. Therefore, tasks and exercises can direct students to individual and/or collaborative learning. Further, the task design for online courses can pre-determine the learning process and its results.

A teacher and a student change roles when entering a new learning culture. **The role of a teacher** changes from authoritarian to one as a motivator, a collaborator and a consultant. **The role of a student** changes from dependent to one as interested, engaged and independent (Karjalainen and Niemi, 2000). Coordination between the changing roles of a teacher and a student determines the type of the interaction between them: a more rapid change of the student's role results in conflict, whereas a more rapid change of the teacher's role results in confusion most often.

Changes of pedagogical concepts, objectives and activities lead to changes of purpose and strategies of **assessment and evaluation** in a transition from traditional teaching to open learning. During transition focus changes from the evaluation of predefined outputs of learning to an assessment of the quality of a learning process. Responsibility for assessment and evaluation becomes shared among all participants of the learning process and the external experts. Therefore, evaluation is not a separate activity anymore; it becomes an integral part of learning.

The authors believe that reflection on the status of all seven elements of the model will help ODL participators to identify the position they take in the transition of a learning culture, coordinate the teaching-learning paradigm among different participators and intentionally choose and master that paradigm, which best suits personal intentions and the situation.

Tool for the support of an ODL participator

The educational idea of the 'tool' originated at Vytautas Magnus University and the theoretical base of the instrument was elaborated in discussions with the BOLDIC (*the Minerva project "The Baltic-Nordic Network for Exchange of Experience in the Area of ODL"*) partners at the international conference "Adult Learning for Employability and Citizenship" (9-10 May 2003 in Kaunas at Vytautas Magnus University). Colleagues from the Distance Education Center at Kaunas University of Technology developed the online tool. The broad ODL community in Lithuania supported the paper's authors by testing and piloting the instrument.

Design and structure of the online tool was determined by the needs of different target groups, i.e. the authors of ODL courses, teachers, tutors, and students and researchers of educational practice. The

technological solution opens possibilities for a multiple languages version, but at the moment this tool is implemented only in Lithuanian.

Different versions of the tool are created for the different ODL actors. A course creator, a teacher/tutor and a student have a possibility to use the specific version of the tool. A course creator has an access, which allows him to perform administrative functions.

To identify the pedagogical bases of the ODL practice, the tool was designed as a multiple-choice questionnaire, which consists of five sets of questions: 1) learning objectives; 2) learning outcomes; 3) tasks and exercises; 4) roles of a teacher and a student; and 5) teaching-learning paradigms. Each set can be used independently as a separate tool and can be answered only once

The user ranks alternatives according to an ordinal scale in the 1st – 4th sets of the tool. The 5th set consists of ten questions with four alternative answers, each of which represents one learning paradigm (NW, SW, NE or SE). The user puts four alternatives in order of priority. The half of the questions covers five areas of pedagogical activities, i.e. structure of the learning material, content provision, learning support and dialogue. The other half consists of questions related to assessment and evaluation.

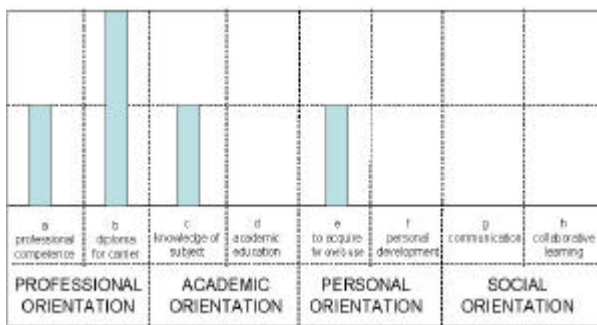


Fig.2 The frame of learning objectives

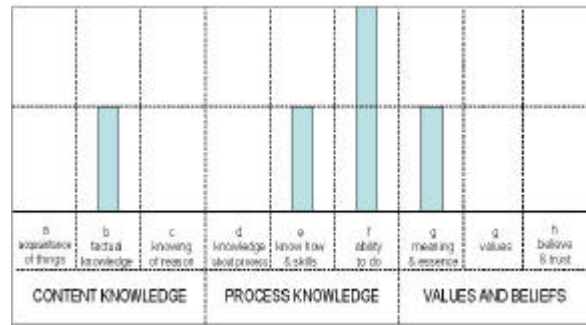


Fig.3 Knowledge as an output of learning

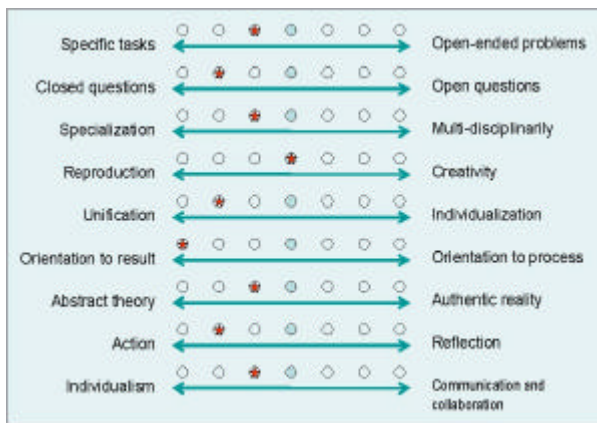


Fig.4 Types of tasks and exercises

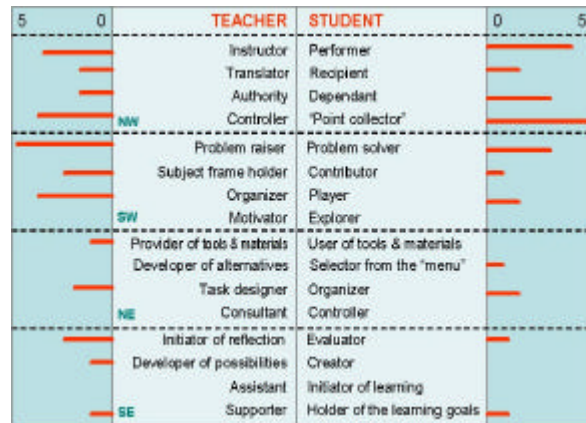


Fig.5 The roles of a teacher and student

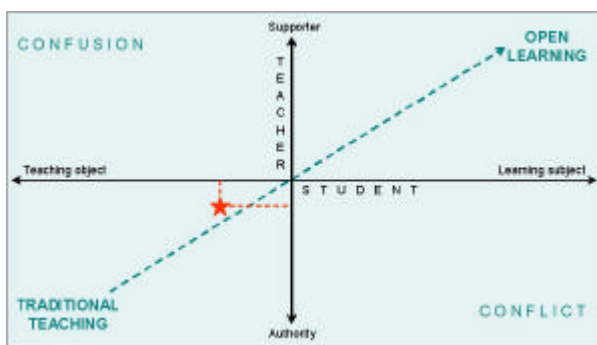


Fig.6 Coordination of the roles in the transition of learning cultures

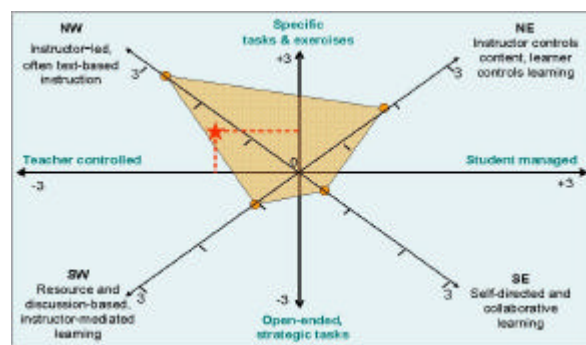


Fig.7 The teaching-learning paradigm

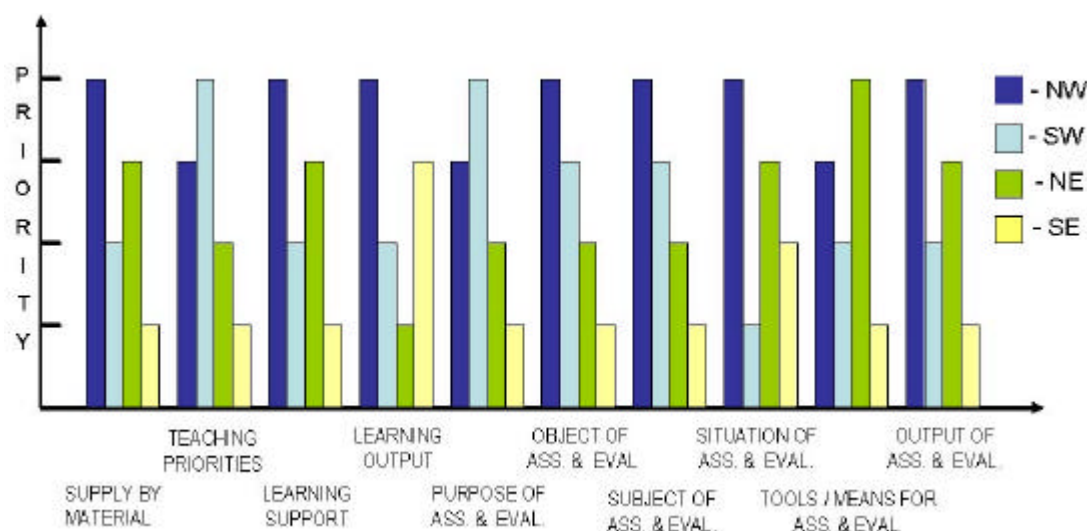


Fig.8 The consistency of the teaching-learning paradigm

The online tool is interactive and it generates an output automatically. A user can get feedback in the form of a visual output after all questions in a set have been answered. The full picture of the pedagogically based ODL practice consists of *seven graphs* (see Figs. 2-8): 1) *The frame of learning objectives* (Fig.2) presents the dominant types of objectives for an individual or the course; the graph is generated from an analysis of the responses to the questions in set 1; 2) *Knowledge as an output of learning* (Fig. 3) gives a chance to identify envisaged or achieved learning outcomes from the perspective of the knowledge typology; set 2; 3) The typology of the tasks and exercises are presented as nine dyads in *the types of tasks and exercises* (Fig.4); set 3; 4) Visual information in the graph *the roles of a teacher and a student* (Fig. 5) is organized into four segments, which point out four teaching-learning paradigms, i.e. the roles of a teacher and a student are laid parallel and that provides the possibility to review the compliance of the roles; set 4; 5) The fact of the *coordination of roles in the transition of learning cultures* (Fig. 6) is shown as a point in the two-dimensional plane; set 4; 6) A few alternatives are suggested in the graph of *the teaching-learning paradigm* (Fig.7); the irregular tetragon represents the position of the teaching-learning paradigm of the ODL practice in relation to the four quadrants, each of them representing one of the four teaching-learning paradigms; the tetragon is drawn from responses in set 5; a spot is marked as a result of responses to the questions in sets 3 and 4; the position of the tetragon and the spot gives additional information about the consistency of pedagogical activities and/or the validity of answers. 7) The consistency of teaching-learning can be evaluated by comparing answers to the different questions in the set 5 (Fig.8)

All data is stored on the online database. For research purposes the data matrix can be downloaded from the online database and analyzed further by means of MS Excel or SPSS for Windows. Summaries of the results from different groups of respondents can be easily developed and visualized manually, according to the needs of the user.

The developers of the tool suggest some **guidelines for its use**. Each participator of the ODL practice uses this research tool in a specific way. A course creator can use the tool in two stages: in a course development the tool is used for setting a pedagogical frame of the ODL course and at the stage of evaluation to evaluate the developed course. A teacher/tutor can use the tool at both stages: in planning pedagogical activities and in the assessment of ongoing or completed courses. Students can assess ongoing or completed courses. There is a possibility to use a single set of questions of the tool, but the *use of all five sets* is recommended. There are two modes suggested for the use of the tool: the individual mode, when a participator analyses personal responses to the questions and the collaborative mode, when a dialogue regarding individual findings is initiated.

Four steps have been foreseen for a broad use of the tool: 1) *identification and articulation* of the main pedagogical ideas and characteristics of practice; 2) *reflection* of the pedagogical bases of practice; 3) *conceptualization* and *evaluation* of the pedagogical bases of the ODL practice, and 4) *improvement* of the ODL practice. Each step can be performed when using the tool in the collaborative mode.

Questions and guidelines for the interpretation and use of results are discussed with users and then added to the tool after the testing procedures.

Two results are envisaged from the use of the tool: 1) increase in the *consistency among the seven elements* in the model (see Fig.1) within individual practice of participators (a course creator, a teacher, a tutor and a student); 2) increase in *coordination among different participators'* leading pedagogical concepts, the frame of objectives and the concrete actions.

Conclusions

An ODL participator can enter a new learning culture only when all elements of pedagogical bases (conceptions, goals and actions) are critically revised and changed in concordance with each other. Changes of the ODL practice can occur in the four-stage process, i.e. the identification of the pedagogical status in the individual and collaborative practice; the reflection on pedagogical bases of practice; the conceptualization and the evaluation of the pedagogical bases and the improvement of practice.

The pedagogical bases should be revised and changed in a coordinated way in all ODL practices, i.e. the development of ODL courses, online teaching, tutoring and learning. Only a continuous pedagogical dialogue between different ODL actors can assure a consistent change in ODL pedagogy.

The online tool supports the identification and articulation of the pedagogical bases of the concrete ODL practice. The use of the tool gives a starting point for a pedagogical dialogue between ODL participators. Any participator (a student, a researcher, a teacher, a tutor or/and an author of an ODL course) can start using this tool and initiating the collaborative processes of identification, reflection, conceptualization and improvement.

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Authors:

Dr. Audrone Valiuskeviciute
Vytautas Magnus University
Center for Quality of Studies and Research
Laisves avenue 53-510
LT-3000, Kaunas, Lithuania
a.valiuskeviciute@smf.vdu.lt

Dr. Giedra Linkaityte
Lineta Zilinskaite, PhD student,
Vytautas Magnus University
Center for Educational Studies
K.Donelaicio 60-507, LT-3000, Kaunas, Lithuania
g.linkaityte@smf.vdu.lt; l.zilinskaite@smf.vdu.lt

INFORMATION COMPETENCE DEVELOPMENT IN NORDIC ODL

Sirje Virkus, Manchester Metropolitan University

Introduction

In modern society everyone needs increasingly sophisticated skills for information handling and use. This includes: identifying, locating, gathering, storing, retrieving and processing information from a variety of sources; using a range of information-retrieval and information-processing skills confidently and competently; organizing, analysing, synthesizing, evaluating and using information; presenting information clearly, logically, concisely and accurately. Library and information professionals call these information-related competencies as ‘information literacy’ and believe that these competencies are pivotal to the pursuit of lifelong learning, and central to achieving both personal empowerment and economic development (Hepworth, 2000; Bruce, 2002; Correia, 2002). However, the debate among politicians concerning the development of an information society and knowledge economy still focus the technological dimension of ICT and do not embrace the concept of an information literate person, who is able to survive and be successful in an information rich environment (Correia & Teixeira, 2003; Audunson & Nordlie, 2003; Boekhorst, 2003; Skov & Sk?rbak, 2003).

Increasing attention to information handling and use in recent years is partly the result of information overload, especially related to the growth of digital information, and partly because of the new focus on student learning in a lifelong learning context. Although there has always been a need to find, evaluate, and effectively use information, the abilities needed to do so have just grown larger, more complex, and more important in the ICT environment. In our modern society students face diverse, abundant information choices; information is available in different forms and places; information comes increasingly in unfiltered forms and in uncertain quality. E-everything and plagiarism is also a concern (Wilson, 2001). It is believed that new learning approaches and greater emphasis on resource based and problem based learning demands a higher degree of ‘information literacy’. In this context, several reports have emphasized the importance of finding, evaluating, and using information although the term ‘information literacy’ is not used (Virkus, 2003a).

While ‘information literacy’ is generally perceived as an essential set of competencies of the information society and knowledge economy and is well-understood in its broader sense, it has made little progress educationally, save for a few exceptions in countries such as Australia, the USA, Canada and the UK (Correia & Teixeira, 2003). Several studies, research reports and articles have expressed concern that many students lack the ‘information literacy’ to transform information into knowledge and wisdom and highlight the importance and needs of information literacy and instructions (Breivik, 1998; Spitzer, *et al.*, 1998; Bruce & Candy, 2000). However, less research has been done on information literacy development among distance students.

The aim of this paper is to present some preliminary results from the survey “Information competence development” in European higher open and distance learning (ODL) from the Nordic perspective. The paper is divided into three parts. The first part of the paper is concerned with the issue why should we care about information literacy in open and distance learning. The second gives an overview about information literacy instructions for distance students. The third describes the aim and the method of the survey and explores the information competence development in the Nordic dual and mixed mode distance teaching universities based on the survey results and literature reviews. However, because of the space limits only some conclusions have been presented in this paper.

Why should we care about ‘information literacy’ in ODL?

The current approaches to learning emphasize learning as a constructive process. The constructivist approach to learning has close connections with the process of information-seeking and use. From the

1970s on, research on human cognition as information-processing has revealed the 'constructive' nature of human learning. Learning consists of complex information processing, problem-solving, decision-making in uncertainty and the urge to transfer knowledge and skills into new, unknown settings. Learning is, in this view, defined as an active, constructive, goal-oriented and situated process that requires intensive mental activity and construction of meaning on the part of the learner (Dillemans *et al.*, 1999). Therefore, to learn constructively involves active seeking, processing and using of information, critical analysis and metacognition. In this context, information-related competencies ('information literacy') may be viewed as context- and content-dependent competencies which are integral elements in a constructive learning environment and are closely related with the characteristics of constructive learners (Virkus, 2003a).

In a constructive learning environment a student is encouraged to think actively and critically about information rather than to passively receive prepackaged materials. Students are increasingly expected to do their own research and solve problems, instead of following reading lists provided by educators. They need to be able to clearly define a subject or area under investigation, to select and employ the most appropriate search strategies and tools to gain access to the needed information and sources, to analyse and evaluate information sources retrieved, for value, relevance, quality and suitability and interpret and apply their findings, by turning the information discovered into new knowledge. Furthermore, ethical questions also need to be considered in respect of copyright, intellectual property and plagiarism (Correia & Teixeira, 2003). Breivik (2000) also notes that academic institutions will have failed their graduates if they do not empower them to be independent lifelong learners who can access, evaluate, and effectively use information. She also points out that in our rapidly changing society, schools and academic institutions can never directly meet all the learning needs of their graduates throughout their lifetimes, but they can assume significant responsibility for creating generations of independent learners. According to Breivik, information literacy abilities both enhance student performance in formal learning settings and allow students to learn independent of such offerings.

New teaching and learning approaches and ICT-based learning environments influence both conventional as well as distance teaching institutions and demand a new set of skills from teachers and learners. However, distance learners are not usually in close physical proximity to their teachers, with technology and other factors mediating the learning experiences provided. This shift in locus of activity requires that students work more independently, creatively and actively than in many "traditional" face-to-face settings (Wagner & McCombs, 1995). Therefore, distance learning students benefit from instruction, which motivates them to learn, allows learners to exercise control over their learning experience, and requires them to be accountable for their own learning outcomes even more than on-campus students (Tenenbaum *et al.*, 2001). For example, according to Rowntree (1995: 207) successful online distance learning requires special student skills for: (a) computing, (b) literacy discussion, (c) time management, and (d) interpersonal interaction. He argued that the focus in online learning is often less on the content than it is on the cognitive process of "offering up ideas, having them criticized or expanded on, and getting the chance to reshape them (or abandon them) in the light of peer discussion". Cole (2000) highlighted the need for online students to have strong reading and writing skills (Rovai, 2003). Rovai (2003) emphasized: "Since online students largely work independently, they also need the information literacy. Deficiencies in these special skills can lead to academic difficulties and attrition". However, it should be also noted that along with paradigm shift in teaching and learning, the distinction between distance and on-campus students slowly disappears and students can act as intelligent consumers who determine the appropriate combination of courses delivered electronically and face to face (Marom *et al.*, 2003).

Information literacy instruction for distance students

Different approaches have been used to develop information literacy among distance students. For example, developing a guide for students to use or for resource evaluation, creating a course Web site giving students a guided tour for searching the Web, developing an assignment where students work on a search strategy appropriate to a problem statement, assisting students in preparation of their literature reviews, developing online tutorials or integrating information literacy into curriculum. It is

believed that an integrated curricular approach is a best practice (Wilson, 2001). It is to be expected that an integrated information literacy component in learning would have a positive impact on students' mastering of context, fulfilling research tasks and problem solving, becoming more self-directed, and assuming greater control over their own learning (Todd, 1995), enabling individuals to engage in a variety of learning situations and opportunities in optimal ways (George & Luke, 1995). However, Dewald *et al.* (2000) note, that stand-alone Web tutorials are still the most commonly used medium for information literacy education online.

The development of information literacy is believed to be especially successful when librarians develop partnerships with faculty members and as partners, incorporate information literacy programs into the curriculum. The literature suggests that when librarians are included in distance education course development teams they are able to make a significant contribution. Following types of contributions in course teams are listed:

- assisting the course writer(s) in identifying appropriate literature and network resources to support the preparation of the course;
- providing advice about networked electronic resources and Internet materials to which students can have access;
- providing information literacy components of the course;
- providing advice about the variety of learning resources that may be employed in relation to the place, mode and pace of delivery;
- ensuring that staff in the library know about new products and modes of delivery before student support issues arise;
- negotiating cost-effective online access for students to licensed electronic resources including bibliographic databases as well as full-text databases;
- information on access to other learner support services provided by the university or available in the community, etc. (Clark & Store, 1998).

However, Bruce (1997) notes that there have been two competing views in the information literacy discourse: the behavioural and information processing approaches to learning, and the constructivist approaches. The former have successfully dominated thinking about information literacy. Consequently, models of information literacy that are skill-based and 'measurable' have been developed. According to behavioural approach an information user, to be described as information literate, must exhibit certain characteristics and demonstrate certain abilities. Less strongly apparent in the literature are the constructivist, and relational approaches. Several researchers refer to the elements of constructivism, but coherent models still do not exist. Their attempts to emphasise inquiry-based, resource-based and problem-based learning are theoretically incompatible with pictures of information literacy that emphasise skills, knowledge, attitudes and linear processes. Bruce suggests to focus on investigating the mental models of experienced information users, or the ways in which people make sense of information. The relational approach supports the idea that any phenomenon may be described as the sum of the different ways in which it is experienced and Bruce own information literacy research support this approach (Bruce, 1997; Virkus, 2003b).

However, despite some progress over the past decade, library and information professionals still report that universal information literacy is a distant, if not a receding, goal (Bruce & Lampson, 2002). Johnston & Webber (2003, 338) note that even in the United States: 'Whilst much attention has been paid to information literacy by American policy-makers, librarians and academics, the results are still relatively narrow, giving a potentially superficial guide to the nature of a curriculum for information literacy higher education'.

Information competence development in the Nordic higher ODL

To map the extent and method of information literacy integration into the European ODL a survey was designed by the author of this paper. This survey aimed to find out the size and scope of information

competence development in European higher ODL and to explore the role of libraries within this process. The member institutions of the European Association of Distance Teaching Universities (EADTU) were selected as a sample for this survey. EADTU is the representative organization of both the European ODL universities and of the national consortia of higher education institutions active in the field of ODL. Therefore it was believed that the EADTU is the important voice of the community for ODL in Europe and its member institutions are representing the most active and innovative actors in the field of ODL.

An email questionnaire (divided into six sections: policy, curriculum, research, high degree supervision, academic development partnership and data about institution) was sent out to all the EADTU member institutions – dual and mixed mode universities that belong to the national consortia of higher education institutions and represent the respective country in EADTU and to open universities in Europe, in 2003. This survey formed a part of the research project “The impact of information literacy on student learning” and the results of this survey helped to identify relevant issues and groups of learners, instructors, policy makers and librarians for further in-depth interviews to model principles of ‘good practice’ in the information competence development.

Previous research indicates that several partnerships are needed to integrate information literacy into curriculum. Bruce (2001) refers to partnerships in diverse areas, including policy, research and scholarship, curriculum, supervision, and staff development. However, it has been evident that little of the literature is appearing in mainstream higher distance education journals or discipline-based journals, suggesting that the transformation of the information literacy agenda from a library-centred issue to a mainstream educational issue is only beginning. The following part of the paper examines how these characteristics are reflected in the Nordic higher ODL institutions.

45 universities and higher education institution from Denmark, Finland, Norway and Sweden are members of the EADTU. These institutions are represented via the Danish Association of Open Universities (DAOU) (3 universities), the Finnish Association for Distance Education (FADE) (3 universities), the Norwegian Association for Distance Education (NADE) (6 universities and higher education institutions) and the Swedish Net University Agency (33 universities and higher education institutions). 29 institutions answered to the questionnaire, 64 per cent out of a total of 45 institutions. Three institutions from Denmark, three institutions from Finland, five institutions from Norway and eighteen institutions from Sweden were among the respondents.

Information literacy policy

It should be noted that there are not national documents or agenda for ‘information literacy’ in the Nordic countries. However, several national initiatives have influenced information literacy developments in higher education as well as open and distance learning. For example, in Finland the Ministry of Education has carried out a national strategy for the period 2000-2004 in the field of education, training and research. In this document a whole chapter is dedicated to libraries, archives and information materials in the virtual university context. In “Denmark’s Strategy for Education, Learning and IT” (2001) the research libraries are identified as key suppliers in the creation of new learning environments. The Danish Electronic Research Library (DEF), a cooperative venture of 38 research libraries, make available digital learning resources via the DEF-portal. In Norway, the government put forward in 2001 a so-called long-term programme for 2002-2005, reflecting the strategies and priorities of the government. In this programme, information literacy stands out as a non-theme in Norwegian politics. However, the realisation of many goals of that document presupposes information literacy. However, it seems that in all these documents the focus has been much more on IT literacy than on information literacy (Sinikara & Järveläinen, 2003; Skov & Sk?rbak, 2003; Audunson & Nordlie, 2003).

It should be also noted that the term ‘information literacy’ used in the English speaking countries does not have an exact parallel in the Nordic countries. The terms used for information literacy refer to competencies: for example, in Denmark the term *informationskompetence*, in Finland *informaatiokompetenssi* (also *informaatiolukutaito*), in Norway *informasjonskompetanse* and in Sweden *informationskompetens* have been used for information literacy.

At institutional level, fifteen institutions declared that they have policy documents that emphasise the need to focus on ‘information literacy’ in curricula or in student learning. Nine institutions noted that policy documents in their institutions included such items as information literacy plans and five institutions noted that policy documents included lists of graduate attributes or “qualities of graduates”. Sinikara & Järveläinen (2003) note that in Finland, as a results of the Finnish Virtual University developments, several universities have included in their strategic planning a demand for students to have good information technology and communication skills and a good knowledge of information skills and literacy without which efficient eLearning is impossible. However, the awareness of a synergy between information literacy and eLearning has developed quite slowly in universities and only a certain proportion of teaching staff has really shown an interest in it. Hepworth (2000) has pointed out a close link between problem-based learning and information literacy. He believes that where problem-based learning takes place there is evidence to suggest that this encourages information literacy, or rather that information literacy is the key to problem-based learning. Eleven institutions mentioned that their policy documents include strategic plans in teaching and learning emphasising the integration of problem-based learning and resource-based learning into the curriculum. However, some preliminary results show, that it is not necessary the case.

Eleven institutions out of 45 institutions indicated that library staff belongs to the educational committees that make decisions about curricula and learning.

Curriculum integration

Seventeen institutions indicated that existing procedures for review of curriculum design in their institution require the incorporation of ideas about ‘information literacy’ development. Twenty four institutions referred to collaboration between librarians and the faculties to integrate ‘information literacy’ into the curriculum and eighteen institutions noted that librarians are working closely with faculty on planning learning. Librarians were also involved in developing courses, providing online tutorial support, assessment and evaluation, were assisting students in the preparation of their literature reviews and their assessed work in the majority of institutions. Librarians were sometimes also involved in developing Web sites for courses and subjects, in product development such as self-paced ‘information literacy’ modules and in Web-based learning materials that may be used by staff and students.

Verbal instructions from tutors or staff, a brief tour of the library, a lecture or seminar especially devoted to information literacy and a section in a student handbook were the most frequently mentioned ways of instruction or advice given students on finding information to support their course work. However, a course or series of lectures devoted to these topics, a phased program of detailed induction by staff and several lectures/seminars on using the facilities were mentioned as well.

Eight institutions indicated that their students earn credits for a unit or component on ‘information literacy’ during their studies on a cross-disciplinary basis and sixteen institutions indicated that credits are earned as part of a discipline specific course. Some institutions also indicated that there are other programs that foster ‘information literacy’ or a range of generic attributes including ‘information literacy’. For example, ICT in language and communication course in the Norwegian University of Science and Technology and a credit bearing course on information literacy that is open for all students in *Högskolan i Skövde* are some of the examples.

Research

Half of the respondents referred to some research in their institutions on ‘information literacy’. Faculty was involved in these research projects in nine institutions and librarians in seven institutions. Only in three institutions both the librarians and faculty were involved in information literacy projects. Half of the institutions also indicated that there is sometimes library and faculty partnership in the area of research into teaching and learning.

Higher degree supervision

There was also supervision partnership between faculty and librarians in many institutions where librarians and faculty shared expertise and responsibility for helping students through the phases of higher degree research, acted as co-supervisors ensuring that literature reviews were relevant, kept supervisors and students up to date with information resources and services and participated in preparation of literature reviews and research proposals.

Academic development partnership

In majority of institutions there were workshops or other activities that aimed to introduce faculty to the idea of 'information literacy' education. In the last 12 months there have been activities in twenty institutions in supporting the development of faculty knowledge and skills in 'information literacy'.

Conclusions

From this questionnaire survey and an overview of the literature it is apparent that much work has been undertaken to deliver information-related competencies in Nordic countries. However, the term "information literacy" or "*informationskompetence*" has not yet made its way into the vocabulary of the official publications. There is little evidence of government initiatives but too heavy an emphasis on technology infrastructure and basic IT skills in many countries. The respondents refer to many information literacy initiatives at institutional level as well as curriculum level and faculty-librarian partnerships have been indicated in the field of teaching, supervision, research and academic development. Information literacy initiatives in higher education have taken a variety of forms: stand-alone courses or classes, Web-based tutorials, course-related instruction, or course-integrated instruction. Although during earlier years much of the teaching activities were separate from the curriculum, now there are trends towards the integration of information literacy into subject areas. Some institutions offer formal information literacy courses: these courses range from for-credit to non-credit, from required to elective. However, it seems that differences between universities, their different faculties and disciplines are still great, making generalisations difficult.

However, implementation and delivery of information literacy education depends on many factors: national as well as institutional policy, teaching and learning approaches, understandings and attitudes of faculty and students, and resources (budget, staffing, facilities, time). Since this study is, thus far, only based on the analysis of the result of the initial questionnaire, trying to map the general picture in the field of information competence development, many questions remain unanswered. However, it is believed that if there are significant information literacy developments in Nordic dual or mixed mode institutions delivering distance education, including policy, research and scholarship, curriculum integration, supervision, and staff development, it will also influence distance teaching and learning programmes in these institutions. The data of the second, qualitative stage of this study will help to approach to these issues more precisely.

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Author:

Sirje Virkus
Department of Information and Communications
Manchester Metropolitan University
Rosamond Street West
Off Oxford Road
MANCHESTER
M15 6LL
S.Virkus@mmu.ac.uk

TRAINING E-TUTORS FOR EFFECTIVE E-LEARNER SUPPORT

Jens Breuer, University of Cologne

After phases of (over-) optimistic commentators who saw a whole new world for learning (e.g. Benjamin 1994), in the meantime a more realistic view of the usage of new media for teaching and learning dominates. Nevertheless, as the economy becomes progressively a knowledge-based economy and lifelong learning grows, the relative mismatch between traditional education and professional knowledge and skill requirements have provided a strong incentive to the educational community to move faster in bringing about curricular and organizational reforms that address better the needs of the new economic and social environment. One possibility is the support of e-Learners by tutors. In this paper, I give a short overview of this field and present a concept of training these (human) e-Tutors.

Theoretical background

In the discussion about e-Learning, for a long time questions of technology and efficiency dominated. But: As with every question concerning processes of learning or teaching, didactical categories like

- the target group,
- themes,
- intentions,
- methods, and
- control of success

have to be focussed on.

Regardless of the level of technology used, certain instructional tasks must always be performed for successful learning (Berge 1995). In my didactical point of view, but also based upon the findings of several studies, successful e-Learning always requires the existence of a teacher or tutor who coaches the learners.

Within the e-learning process, different channels of communication can hinder or facilitate interpersonal interaction and interaction with content. For that reason, the research about computer-mediated communication (CMC) and computer-supported cooperative learning (CSCL) has to be taken into account when dealing with e-Learning and e-Tutoring.

How communication with computers as medium is affecting behaviour and experience of transmitters and receivers, is a field of research that provides very different findings (as one of the first: Kiesler/Siegel/McGuire, 1984). Different models set up conflicting theories, whose statements partly contradict themselves, because they are based on different models of media effects.

CSCL places emphasis on the group as the locus of knowledge building and on the global independence of learning. In this way, knowledge is a product of the collaboration process that arises through interaction of different perspectives and is gradually refined through negotiation (Stahl, 2002; Kaye, 1992; Koschmann, 1996).

E-Tutors as coaches of e-Learners

On the basis of CMC and CSCL, e-Learning-processes require a special form of teaching. The support of e-Learning-processes is a field of activity in which some special characteristics have to be considered. E.g. communication does not adjust itself between the learners simply by bare request. Giving and taking feedback, control of the attention of the learners or energizing group processes

differ without face-to-face contact between teacher and learner. The role of the teacher in e-Learning-processes often is described with such arrangements as a facilitator, moderator etc.

E-Tutors are teachers in e-Learning-processes who advise groups of cooperatively or individually learning people. This includes particularly the design, the encouragement and the support of learning processes and of cooperation and communication between the learners. The tasks and the competencies necessary therefore overlap with the tasks and competencies of a normal 'presence' teacher but are in parts significantly different.

Concerning the actual tasks that an "e-Tutor", "e-Moderator", "e-Trainer" etc. is confronted with and also concerning the competencies he or she has to acquire therefore, there are a few theoretical models or concepts and a lot of courses offered on the market. Which model or which course is the best is difficult to agree on.

To work out the actual tasks of e-Tutors and their competencies, I started a broad literature analysis and will carry out an empiric study in which the field of operation of actually acting e-Tutors will be analysed. This survey will probably start in spring 2004 and will be restricted to Germany.

Just to give an example, key tasks of an e-Tutor could be:

- diagnosing learner's needs
- helping learners get started
- explaining content
- assessing progress
- giving feedback
- promoting activity
- giving encouragement
- trouble-shooting problems
- preparing the learning environment
- recording progress (Ufi, 2000, p. 6. More detailed and characterised as "pedagogical recommendations": Berge, 1995)

An example for the description of competencies (Salmon, 2000, pp. 39. In the author's terminology: „qualities and characteristics of successful e-moderators – the competencies they should acquire through training and experience“):

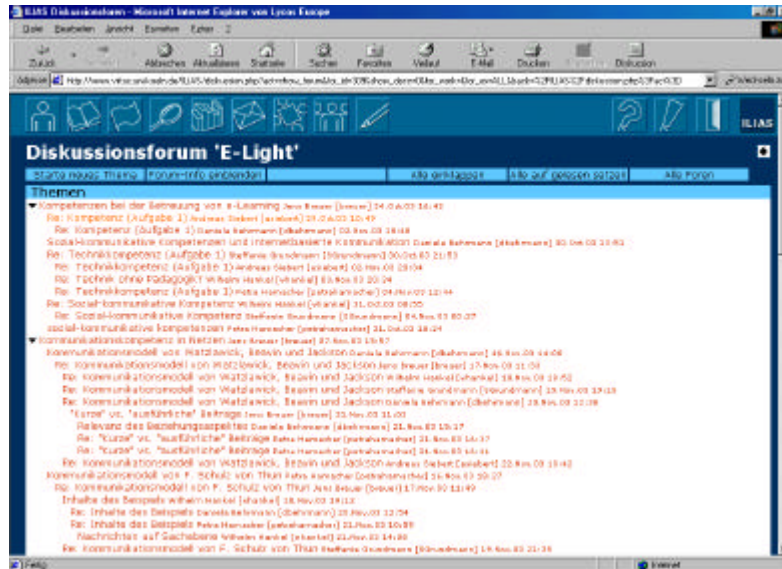
- understanding of online process
- technical skills
- online communication skills
- content expertise
- personal characteristics

E-moderators are the new generation of teachers and trainers who work with learners online (Salmon, 2000, p. viii). They have "the responsibility of keeping discussions track, contributing special knowledge and insights, weaving together various discussion threads and course components, and maintaining group harmony" (Rohfeld & Hiemstra, 1995, p. 91).

A concept of training e-Tutors with ILIAS

At the University of Cologne, a new concept for the training of e-Tutors was developed. This concept was tested and validated during a field study with a group of students who originally study to become a (presence) teacher of economics. Experience about tasks and competencies of e-Tutors was in this

way gained from two sides: on the one hand side, students were educated in three thematic issues that we derived from a broad literature review: “Communication competence for e-Learning”, “Supporting and coaching cooperative e-Learning” and “Motivation of e-Learners and evaluation of success of e-learning-processes”. On the other hand, as the courses were held as blended learning seminars with phases of e-Learning (in which members of the project group acted as e-Tutors), participants gained experiences as e-learners and experiences about what an e-Tutor actually does. In phases of e-Learning, mainly the discussion forums of the open source LMS ILIAS were used to communicate and cooperate.



The forums of the LMS ILIAS

Additionally, at the end of the courses participants had the opportunity to act as e-Tutors themselves, as they took the role and the tasks of the tutor within their subgroups (5-6 participants each) one after the other. Thus, in this phases, participants of the course were responsible for the maintenance of the learning process within their subgroup. This innovative approach seems to be very successful, as it consists of gaining experiences and putting them into action.

The members of the project group who acted as e-Tutors during the whole course were able to evaluate the developed curriculum through gaining their own experiences while acting, which is only a small part of the evaluation concept that we developed for our e-Tutoring-concept. It was both evaluated in a process and product evaluation.

Our concept of getting teachers accustomed to their new roles and tasks is on the one hand well theoretically funded, for example by the social-constructivist learning theory approach. On the other hand it is very feasible and can easily be adapted to other fields of practice, e.g. to companies.

At the conference, I will give an overview about competencies and tasks of e-Tutors and report on practical experiences gained from the described blended learning trainings and lessons learned.

Research approach and methodology

The design is based on a paradigm integrative philosophy of science. Its main focus has been laid on the empiric component, but it also includes a hermeneutic-interpretative understanding and can be characterised as a two-stage process in which the progress of the conclusion outranks the methodical and methodological accuracy.

Starting point of the analysis are several central questions, which are directly founded on the motivation of the research and the cognitive interest, which is discussed on the last pages. The hermeneutic-interpretative procedure includes the analysis of the existing literature (literature

overview), the analysis of explorative studies, as well as the monitoring of practical experiences. The central questions are transformed into main hypotheses and, continuative, sub-hypotheses.

This is shown by the following, not completed example: The central question

- What are the tasks of an e-Tutor?
- can be transformed into the main hypothesis
- One of the tasks of an e-Tutor is the support of the learners.
- with the sub-hypothesis
- One of the tasks of an e-Tutor is the individual support of single learners.
- One of the tasks of an e-Tutor is the support of groups of cooperative learners.

Afterwards, all these hypotheses have to be verified. The verification of these hypotheses is based on the Critical Rationalism and the principle of falsification (Popper, 1968, p. 40). In other words, these hypotheses are corroborated until falsified (proven wrong).

With the dependence on the theory of Critical Rationalism however the adoption of the postulate of absence of value judgements is explicitly denied. The orientation towards norms is a basic prerequisite of pedagogical scientific works (Heid 1995). Norms have an influence on (my) scientific actions since I explicitly point out the influence of subjective and interpretative approaches. The development of a competency profile of an e-Tutor for instance is also influenced by personal impressions and therefore oriented towards norms. However, at this point subjectivity does not under any circumstances imply arbitrariness. A demonstrative display of the underlying norms results for my scientific actions.

Regarding the methods of research, it is laid down that methods are seen as subordinates of both content and the results of research. A research method must always be judged by its potential to be useful for gaining knowledge or for reaching certain goals. Advantages and disadvantages of a method must be evaluated by looking at the content of the research and the goals to be reached.

Two courses are adopted to verify the proposed theses: An experimental-evaluative course and a qualitative-empiric course.

The experimental-evaluative course realizes the training I designed (which is discussed in the previous chapter) by performing and evaluating several experiments (as a form of action research). A corresponding method of research would be the qualitative interview and, as a support, selectively quantitative questionnaires.

The empiric study analyses the field of operation of people who actually act as e-tutors. By measuring the attitude of those concerned it can be decided if the hypotheses are corroborated or falsified in a practical environment. For this study it is necessary to decide on factors like region, institution, etc. The mutual dependence of the factors and the hypotheses has to be considered as well. A corresponding research method would be the quantitative questionnaire.

The quantitative and qualitative results gained are finally brought together (triangulation: Denzin, 1978, p. 291) to make it possible to make statements about the options of the design of a program of e-tutor education. These options of design cannot strictly be deduced, but they are the results of (another) hermeneutic interpretation.

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Author

Jens Breuer
University of Cologne
Chair of Economics and Business Education
Herbert-Lewin-Str. 2
50931 Koeln
Germany
jens.breuer@uni-koeln.de

TUTORING IN MECHANICS AT A DISTANCE

Tony Burden & Ian Cohen, *Kungliga Tekniska Högskolan*, David Dodd, *Auckland University of Technology* & Göran Karlsson, *Kungliga Tekniska Högskolan*

Distance teaching is big business in some fields such as business studies and computer education but it has proved more difficult to provide satisfactory distance education in the mathematical sciences. This paper describes an attempt to carry out tutoring in the subject area of mechanics in small groups and at a distance, *i.e.* the tutors and the pupils communicate *via* the Internet rather than being present in the same physical room.

Tutorials in very small groups constitute a method of teaching with high quality in the sense that the method has the potential to strongly support active learning and to encourage a deep approach to knowledge and understanding. In a small group the tutor has the opportunity of providing a high level of feedback and guidance aimed at each individual student's level of understanding and learning strategy. See, *e.g.*, Anderson (1984), and references therein, or Salmon (2000). Compared to a lecturer in front of a large group of students it is also easier for the tutor in a small group of students to reveal more of his or her own enthusiasm for the subject area and to demonstrate more of his or her own skills, *e.g.* in problem-solving. See, *e.g.*, Marton *et al.* (1984) or Ramsden (1992).

Tutorials in which a member of staff leads a seminar-like group discussion are part of the teaching at undergraduate level at most British institutes of higher education (Anderson, 1984). In the colleges of the two oldest British universities at Oxford and Cambridge students are traditionally tutored or 'supervised' in groups of fewer than five students. (This traditional form of teaching is facilitated by the relatively high ratio of research staff to undergraduates at these universities and by the relatively strong economic resources of the colleges.) For example, students reading mathematics at the University of Cambridge are assigned two 'supervisors' or tutors, one in pure and one in applied mathematics. The students then meet each supervisor for an hour each week to discuss primarily the solutions to assigned sets of problems but also, as appropriate, to discuss the contents of the lectures, the choice of texts books, *etc.* Typically the tutor sits at a table with a student sitting on each side of him or her and develops a solution to a problem using pen and paper. This style of tutoring is quite different to that carried out in seminar-like discussion groups in other subject areas such as the humanities, social science or business studies. Compare Anderson (1984) or Salmon (2000). 'Supervision' in mathematics at Cambridge clearly has an element of the 'transfer of skill' from expert from novice, from Master to apprentice. This form of tutoring is particularly appropriate in subject areas such as applied mathematics, theoretical mechanics, and mathematical physics in which there is a strong focus on problem-solving and a need for the undergraduate student to develop the appropriate skills. See *e.g.* Zajchowski & Martin (1993). The central practical features of this form of tutoring are the problem sets, the tutor's pen and paper, and the smallness of the group. (Even so students reading mathematics at Cambridge have to agree on who should keep the written solutions when the hour is over.)

An introductory (basic) course in mechanics is essential for most engineering schools. One reason for this is the studies *per se* of motion, forces and the relations between them; related to this is the basic vocabulary it gives, needed for studies in many engineering and science courses. Another reason is that because of the subject's emphasis on problem solving, it develops the students feeling for mathematical modelling. A third reason is a general insight into scientific thinking and reasoning. However, it has long been internationally known that basic courses in mechanics are troublesome for many students in engineering sciences See, *e.g.*, Duit (2003) or Zajchowski & Martin (1993). Many difficulties appear in parallel: Mathematical competence, the concept of models, insight into and analysis of the natural phenomena which one wants to describe, too shallow reflection leading to the lack of deep learning and understanding. Tutoring in small groups is a particularly appropriate form of teaching for dealing with these difficulties.

Tutoring in distance education

A great deal of tutoring in distance education is carried out in asynchronous, www-based discussion forums or ‘computer mediated conferences’. See, *e.g.*, Salmon (2000). This technique successfully supports seminar-like discussion groups in subject areas such as the humanities, social science or business studies but cannot emulate, *e.g.*, ‘supervision’ in mathematics at the University of Cambridge as described above. In fact it is only just becoming possible to write mathematical symbols and equations in discussion forums on the web and many mathematicians and scientists would much rather use a pen than a keyboard (particularly if using the keyboard involves the use of a code such as TEX).

An alternative strategy consists of the development of automated (pre-programmed) and highly interactive ‘feedback’. See, *e.g.*, Bork (2001) or Bork & Gunnarsdottir (2001). This strategy has the potential of providing many of the benefits of face-to-face tutoring and even conceivably some benefits that such tutoring is unable to offer. Automated tutoring, or highly interactive feedback, can furthermore be provided to a nearly unlimited number of individual learners in the (target) group that it has been developed for. All the same we are exploring a very different strategy which is much closer to face-to-face tutoring on campus.

Synchronous tutoring in mechanics

‘Face-to-face’ tutoring would appear to be the very antithesis of distance education but we appear to have reached the stage which makes live tutoring of mathematical subjects at a distance possible. This has only recently become possible with the advent of reasonably cheap computer hardware and relatively easy-to-use and versatile software at the same time as the spread of Internet availability, with broadband communication rates, and student computer literacy have continued to improve. The tutor can replace his or her pen with a ‘digitalising pen’ connected to a computer and a person following a distance course in mechanics, or any other mathematical subject, can be offered Oxbridge-style tutoring *via* the Internet using readily available, and even free, software. If the Internet connections are fast enough this form of tutoring at a distance is virtually face-to-face. It’s more important characterization is however that it is synchronously ‘pen-to-screen’ and coupled to a telephone-like conference. (In contrast to tutoring on campus all the students can save a copy of the tutor’s written solution.)

Earlier attempts to simulate campus education at a distance have failed because one or more of the factors mentioned above have not been in place. One of the most successful earlier projects is the PLATO project which at its height had over 100 campuses around the globe. (See the project’s www site.) However tutoring was done by local instructors and the courseware was on computers. In fact, most attempts at distance education, have largely centered on producing materials on computers and more recently this has developed into courseware on the net. Generally, this has not proved popular with students, and not justified the enormous amount of time which has been invested in producing all this material. Moreover, as Information Technology is developing at an incredible rate, materials tend to become obsolete very quickly, at least compared to text books.

We are exploring a tutoring strategy that is very different from asynchronous discussion forums and highly interactive feedback. For most students human contact is of primary importance in stimulating an interest in a subject and the will to work at the subject. This is clearly demonstrated by the recognised significance of ‘teacher presence’ in asynchronous discussion forums. Thus a vital ingredient in our distance courses will be distance tutoring by qualified faculty and we will also encourage interaction between students by giving them joint projects. However, courseware will largely be traditional text books at least in the early stages of this project. We realize that computers have many advantages in presentation of subject matter compared to books but this requires an enormous investment in human effort. The initial experiences of ‘live’ tutoring using a digitalising pen have been encouraging.

Mechanics is a particularly appropriate subject area as if we succeed in distance courses in mechanics this will open up the way for teaching both mathematics, physics and other mathematical subjects in science and technology.

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Authors

Dr Anthony Burden
Kungliga Tekniska Högskolan, Dept. of Mechanics,
100 44 Stockholm, Sweden,
burden@mech.kth.se

Dr Ian Cohen,
Kungliga Tekniska Högskolan, Dept. of Mechanics,
100 44 Stockholm, Sweden,
ian@mech.kth.se

Dr David Dodd,
Auckland University of Technology, Dept. of Mechanical Engineering,
Private bag 92006, Auckland 1020, New Zealand.
david.dodd@aut.ac.nz

Dr Göran Karlsson,
Kungliga Tekniska Högskolan, Dept. of Mechanics,
100 44 Stockholm, Sweden,
karlsson@mech.kth.se

THE ROLE OF TUTORS IN THE DELIVERY OF E-LEARNING

Maggie McPherson & Miguel Baptista Nunes, University of Sheffield

Introduction

Since the Information Society industry is increasingly demanding more flexible and self-confident professionals with skills in communication, problem analysis and problem solving, planning and networking, and long-life learning (Kakabadse and Korac-Kakabadse, 2000), the role of HE is becoming wider and a great deal more complex. Specifically in the case of continuing professional distance education (CPDE) it now encompasses not only the transference of subject specific knowledge, but also the capability of applying these skills in the context of specific fields or industry sectors (Nunes et al., 2000a).

However, most traditional universities have a tendency to subsume open, distance and flexible learning activities within the resources of the broader campus-based remit (Cornford and Pollock, 2002:30). For CPDE e-learning projects, which inherently fall outside this traditional view of education, this poses a major problem. In fact, e-learning for CPDE implies much more than a simple technical exercise in which some materials or processes are simply transferred from the offline world to some ready-made online realm (ibid: 12). Duke (2002) proposes that this approach calls for more in terms of pedagogy than simply “putting professors’ lectures onto the web”. Furthermore, as many e-learning projects start as small-scale departmental initiatives (Robinson, 2001), often the result of individual or small-team initiatives, the implementation of e-learning faces high level of risk because of its uncertain status and unfamiliarity. Accordingly, the focus is frequently placed on design and developing information and communication technology (ICT) based environments and insufficient attention is given to the delivery process. These efforts have little chance of succeeding without a tutoring team that has appropriate online tutoring skills necessary to explore and maximize the designed environments. Therefore, the tutoring team is at least as important as the design team. Furthermore, both parties need to be aware of appropriate pedagogical approaches in order to maximise the benefits of tutoring and the use of learning environments by students.

This realisation has triggered a resurgence of interest in educational approaches and epistemologies, such as constructivism and problem-based learning (Nunes and McPherson, 2003a). These have been identified as possible ways of maximising these online learning environments. As a consequence, educationalists feel compelled to adopt these new methods of learning provision, without being properly equipped with the basic skills required to successfully support learners in online learning environment (McPherson *et al.*, 2003). In fact, learners are expected to develop high cognitive skills such as negotiation of meaning, life-long learning, reflective analysis and meta-cognition, supported by tutors, who often lack these same skills themselves (Nunes and McPherson, 2003b).

Therefore, designing and delivering e-learning is not simply a matter of selecting a tutoring team with subject matter expertise and/or technical skills, but is also choosing educationalists with pedagogical, information and communication skills that are required to manage and facilitate online learning. Thus, the choice of a suitable tutor team with appropriate skills, or at least the willingness to acquire these, is essential to successful online learning.

The Role of the Online Tutor

As discussed by McPherson *et al.* (2003), online tutoring and leadership has been widely considered as a crucial factor in the success of computer-mediated collaborative learning activities. Different and alternative names have been used in the literature referring to the role of the tutor in on-line interaction, such as *coach* (Murphy et al., 1998), *leader* (Hotte and Pierre, 2002), *tutor* (Gerrard, 2002), *moderator* (Kerr, 1986; Feenberg, 1986; Salmon, 2000; Berge 1995), *facilitator* (Collison et al.

2000; Marjanovic, 1999; Berge, 1992), *motivator, mentor, mediator* and even *production coordinator* (English & Yazdani, 1999).

Nevertheless, most studies focus on online tutoring as provided by an assigned e-moderator (Salmon, 2000:7-11). These moderators were divided into institutional interveners, appointed interveners and natural interveners by Hotte and Pierre (2002), that is, tutors, experts, and learners. This paper focuses on the institutional interveners, i.e. the academic tutors that support the students throughout their learning process. In fact, by making the decision to adopt online learning delivery, educationalists will need to re-evaluate their roles as academic tutors, since familiar face-to-face teaching solutions may not work in an online learning environment. This, in essence, means that professional practices are indeed changing.

As McMann (1994) points out, roles that have to be performed as part of e-tutors' tasks are actually not very dissimilar in nature in relation to the traditional face-to-face tasks. Nevertheless there are significant differences that were identified from the very start of e-learning as a delivery mode. Authors such as Mason (1991) discussed the roles of e-tutors as involving responsibilities at both technical and educational level. Mason (1991) focused on the discussion of the educational role of the on-line moderator that involves three categories: the organisational, the social and the intellectual. Berge (1995), based on a thorough literature review, further developed this characterization and identified four main e-tutor roles:

- *Pedagogical or intellectual roles* are some of the most important for the e-Learning process (Paulsen, 1995). The e-tutor uses questions and probes for student responses that focus discussions on critical concepts, principles and skills (Zafeiriou, 2000:67). These roles may include a number of tasks such as: opening the discussions, focusing on relevant content and issues, intervening in order to promote interest and productive conversation, guiding and maintaining students' involvement in discussions, and summarising debates. Additionally, these roles may encompass directing and focusing discussions on vital points (Davie, 1989), synthesising points made by the participants (Hiltz, 1988) and providing summaries and interpreting on-line discussions (Feenberg, 1989).
- *Social roles* involve the creation of friendly and comfortable social environments in which students feel that learning is possible. McMann (1994) considered the social role to be one of the key critical success factors in on-line learning. In this context, e-tutors are responsible for: guaranteeing opportunities for participants to introduce themselves; identifying and dealing with lurkers who are reticent and sometimes reluctant to participate; ensuring that appropriate communication takes place; taking into consideration cultural and ethnic backgrounds by minimising humoristic, offensive and disruptive behaviour; promoting interactivity between students; and finally, dealing with flaming, should this occur, by reminding participants of the appropriate netiquette.
- *Managerial or organisational roles* involve setting learning objectives; establishing agendas for the learning activities; timetabling learning activities and tasks; clarifying procedural rules and decision-making norms (Paulsen, 1995; Mason, 1991). These roles also include: encouraging participants to be clear, responding to the participants' contributions, being patient, following the flow of the conversation and encouraging comments, synchronising, handling overload of information, encouraging participation, and ending the sessions (Zafeiriou, 2000:67).
- *Technical roles*, possibly the most daunting for academics, involve becoming familiar, comfortable and competent with the ICT systems and software that compose the e-learning environment. Additionally, this role includes supporting the students in becoming competent and comfortable themselves (McCreary, 1990) by providing technical guidance such as: offering study guides, directions and feedback on technical problems, ensuring that time to harness the ICT systems is made available and encouraging peer learning.

Basic Online Tutoring Skills

From the characterisation above, it is clear that, although similar in many respects to face-to-face (f2f) delivery, e-tutoring differs in a number of ways as discussed by Gerrard (2002) since it:

- places greater emphasis on written skills;
- produces a more formal tone;
- does not follow a linear conversation but instead promotes multiple conversations;
- does not confine teaching to specific times;
- places greater emphasis on student-student learning;
- requires teachers to develop new ways of encouraging participation;
- requires teachers to assess the worth of online contributions.

Therefore, even for the more experienced f2f tutor, there is much knowledge to be acquired about the skills required for e-learning. Consequently, the e-tutor must in addition to the subject matter expertise and traditional pedagogical training, be able to demonstrate additional skills such as an ability to:

- plan and organise delivery by clearly specifying learning objectives and outcomes;
- set learning agendas and providing leadership and scaffolding in learning activities;
- welcome and embrace diversity of learning outcomes, attitudes and styles;
- adapt supporting styles to the needs of individual participants;
- provide advice on different levels of access to learning materials according to the needs of individual participants;
- create an atmosphere of collaborative learning of which the e-tutor him/herself is often an integral part;
- be able to cope with and resolve on-line conferencing conflicts and difficult behaviours;
- encourage active construction of knowledge by being actively involved in discussions, activities and debates;
- develop and implement methods for learner feedback and reinforcement;
- present advance organisers into the content materials and advice on learning pace so as to avoid cognitive overload and information anxiety.

This new set of skills poses particularly difficult challenges in the selection of online tutors. In fact, subject matter expertise is usually certified by either academic institutions or professional bodies and thus making it easy for selectors to identify suitable candidates. Similarly, traditional educational qualifications are easily recognised. However, e-tutors require the additional and crucial set of skills described above, which makes it very difficult for selectors to choose appropriately qualified candidates to fill this role. This is not to say that there are no appropriate candidates, but that it is problematic for them to provide evidence that they possess these skills. To compound this situation, there are now a myriad of short courses of varying quality that purport to certify e-tutors, but fail to adequately prepare them. On the other hand, there are a few well-established post-graduate courses in online learning that are very effectively preparing e-tutors. However, there are insufficient graduates from these courses to fill the current demand for e-tutors.

Online Learning Skills

However, it is not enough that tutors are prepared for online learning, the learners also need preparation. Due to the hype associated with online learning, learners often feel compelled to engage with these new environments, without being properly equipped with the basic skills required to be successful (Nunes et al., 2000a). In fact, students are expected to develop high cognitive skills such as negotiation of meaning, long-life learning, reflective analysis and meta-cognition without being

properly trained in low-level skills such as the basic use of computer mediated technology, online social skills, online etiquette, web navigation, and web searching. These skills were identified by Nunes et al. (2000b) as *Networked Information and Communication Literacy Skills (NICLS)*. These skills are not only required to succeed in the online learning environment to which learners are exposed, but are also an essential part of all aspects of daily networked activity.

In the future, these basic NICLS will be addressed and acquired at lower levels of the educational system, namely at primary school levels. However, most students enrolling in HE courses are young adults, having only acquired the traditional basic educational skills: reading, writing, spelling, handwriting and numeracy (Bramley, 1991). Unfortunately, these are insufficient skills to learn effectively in a REAL.

NICLS complement the traditional basic skills with a new set of information and communication literacy skills. Information literacy includes recognising information needs, distinguishing ways of addressing gaps, constructing strategies of locating information, locating and accessing information, comparing and evaluating information, as well as organising, applying and synthesising information (Webber and Johnson, 2000). Additionally, the limitations and affordances of conferencing technologies require adaptations and changes in human behaviour for successful communication to take place (Musselbrook et al., 2000). The skills required to undertake such a change when communicating online form what can be considered communication literacy as suggested by Pincas (2000). The conjunction of these two new types of literacy form what Nunes et al (2000b) identified as NICLS.

Learners must acquire NICLS before actually engaging with any online learning activity. Failure to address this issue in online learning, leads to much frustration for the learners, and eventually to lower levels of success for the online learning courses (Hara and Kling, 1999). In sum, NICLS can clearly be divided into two main categories: CMC and information skills. CMC skills are related to the interaction of the student with the learning community and information skills are related with problems of information anxiety and overload as well as access to the learning resources.

Online Learning Resources and Facilities

In addition to well-prepared tutors and students, successful e-learning requires pedagogically sound, well-designed online learning resources. As proposed by Kommers (1996), learning resources are those information resources the learner might need at a particular moment in learning, thinking or designing new ideas, while engaging with a particular learning activity. Modern approaches to teaching and learning, such as constructivism, problem-based learning and experiential learning, assume that knowledge is acquired through social negotiation, experience and reflection, i.e., resulting from the construction of meaning from interaction with specific contexts. This construction results from two different types of interactivity in the learning process (Bates, 1991).

The first is an individual, private activity between the learner and the learning materials, which may range from the traditional textbook to computer-based simulations. The second is a social activity, between the learner and the tutor, the facilitator or other learners.

Private interaction with the learning and conceptual materials is expected to promote learning by provoking cognitive restructuring (Shulman and Ringstaff, 1986). Cognitive restructuring occurs as learners revise their ways of thinking to provide a better fit to reality when faced with discrepancies between their own ways of viewing the world and new information (Rogoff, 1990). Social interaction with tutors and facilitators is expected to promote development through the guidance provided by interaction with people who have are skilled in solving the problems emerging from the learning activities (Rogoff, 1990). Social interaction with the learner's peers is expected to promote learning by joint problem solving and meaning negotiation between partners working with independence and equality on each other's ideas (Rogoff, 1990).

Both private and social interactivity are required in the process of social negotiation and have to be supported by the learning environment. If learning is a process of socially constructing a communal understanding and a collective constructive social process (Zuccheromaglio, 1993), then the learner

must be surrounded by a rich learning environment that provides resources to support the communication and negotiation processes between members of the learning community.

Conclusions

This paper discusses the importance of online tutors in the success of e-learning solutions. Since, as the main people responsible for the delivery of the courses and the support of the learners, online tutors play a critical role in e-learning, they must therefore be equipped with an appropriate set of skills and attributes in addition to subject matter expertise. Thus, the process of selecting the online learning team is probably one of the most important critical success factors in learner acceptance of e-learning. This process of selection is particularly important when changing the mode of delivery in HE from a traditional approach to an e-learning mode of delivery. However, due the current difficulties in acquiring appropriately qualified and certified tutors, the team must at least include individuals with the willingness to acquire the necessary skills outlined in this paper. This means that appropriate tutor support mechanisms must be put in place in order to provide tutor training prior to the actual delivery and just-in-time training during the delivery phase.

Furthermore, learning in online learning environments has to be supported by appropriate resources and requires a number of specific skills from the learners. This need for learner support clearly requires a different approach from conventional theory. Consequently, Online Learning Support (OLS) could be defined as computer-mediated approaches to support and facilitate learning, using a combination of skills that encompass information and IT expertise, as well as expertise in the educational uses of online learning resources, environments and communication technologies. In the light of this, it is possible to distinguish three different critical success factors for OLS that need to be addressed: online tutor skills, online learning skills and specifically designed online learning facilities.

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Authors:

Maggie McPherson

Miguel Baptista Nunes

Department of Information Studies, University of Sheffield

Regent Ct, 211 Portobello St, Sheffield, S1 4DP, UK.

m.a.mcpherson@sheffield.ac.uk

j.m.nunes@sheffield.ac.uk

SPLITTING TUTOR ROLES: SUPPORTING ONLINE-LEARNERS WITH GROUP TUTORS AND SUBJECT TUTORS

Ilke Nübel & Michael Kerres, Universität Duisburg-Essen

1 Introduction

Student support has (at least) to ensure group well-being and to provide help on the subject matter. In the typical university context a single teacher or tutor fulfils both roles. In a distance education context student support has to fulfil even more tasks.

Especially in distance learning programs there is the risk of students feeling isolated, a lack of self-directions and management, and eventual decreases in motivation levels (Abrami and Bures 1996). This sense of isolation is linked with failing academic achievement (Booher and Seiler 1982), and negative attitudes and overall dissatisfaction with the learning experience (Thompson, 1990). Thus, according to Moore and Kearsley (1996), the level of interaction and support are the most important factors to online student attrition and to avoid that students may drop out of an online program. This point of view is also supported by Tinto's (1997) model of institutional departure which says that student persistence is strongly predicted by their degree of academy integration (e.g. performance, academic self-esteem, identity as a student, etc.) and social integration (e.g. personal interaction, connection to academic community, etc.).

High levels of interaction and support can be offered by different role models of student support. The aim of this paper is to point out a split-role-tutor concept which allows an individualized and personalized student support and which provides "an environment where students feel at home, where they feel valued, and which they find manageable" (Tait 2000, p. 289). Further we will outline the application of the split-role-tutor concept in our online master degree programme¹.

2 Meaning of Learner Support in Open and Distance Learning (ODL)

A decade ago Sewart (1993) claimed that student support must acknowledge and respond to the "almost infinite" needs and differences of its clients (p. 11). To meet the expectation of Sewart we will underlie the understanding of learner support by the definition of Thorpe (2001) who defines learner support "as all those elements capable of responding to a known learner or group of learners, before, during and after the learning process" (p. 109).

Therefore the primary functions of learner support services for students in distance education settings are, according to Tait (2000), the following (p. 289):

1. *Cognitive*: supporting and developing learning through the mediation of the standard and uniform elements of course material and learning resources for individual students.
2. *Affective*: providing an environment which supports students, creates commitment, and enhances self-esteem; and
3. *Systematic*: establishing administrative processes and information management systems which are effective, transparent and overall student-friendly.

Those three categories lead over to the *split-role-tutor concept*. As the split-role-tutor concept suggests various student supporter roles, each role is responsible for another support function, entirely in terms of Tait (2000).

¹„Master of Arts in Educational Media“: a four semester-distance education program of University of Duisburg-Essen, organized by Duisburg Learning Lab (see <http://online-campus.net>)

Further the split-role tutor concept offers the opportunity to meet the following three interrelated elements (Thorpe 2001) which enhance the student's satisfaction during the online learning process:

1. *Identity*. The learner interacts with the learner support services personnel on a one-to-one basis. As the tutor knows the learners in person, the conversation between tutor and learner can be much personal.
2. *Individualization*. The interaction between the learner and the tutor is individualized, based on the specific needs, concerns and goals of the learner.
3. *Interpersonal interaction*. The interaction between learner and tutor is mutual and reciprocal. Goals are learning and performance rather than simply information delivery.

In a distance learner support services environment, the elements and functions mentioned above can be realized through the split-role-tutor concept.

3 The split-tutor-concept: Group and Subject Tutor

The split-tutor-concept classifies the different support functions in various tutoring roles. There are two main tutoring roles: the group and the subject tutor. If the students have technical or administrative questions or problems they get individual support in those domains.

In the following paragraphs we describe the split-tutor-concept on the basis of our Master program Educational Media.

3.1 Group tutor

The group tutor is the primary contact person for all organizational questions and questions concerning the communication and motivation of students in learning groups. In our online Master program, a learning group has five to seven members; therefore, the tutoring is rather intensive.

At the first face-to-face (FTF) meeting, the students build learning groups and choose a group tutor. During the FTF-meeting, the group tutor takes over the following duties:

- Presentation of the group tutor and the group members:
The group tutor presents himself to the group and activates his group members to get to know each other.
- Finding a name for the group:
To strengthen the identification with the group, the group tutor helps the learning group to find an expressive name.
- Defining rules for the internal communication:
To avoid problems in the communication processes, the group tutors develops some rules for the communication processes in cooperation with the learning group members, e.g. tell the tutor, if you are absent on business or on vacation.
- Introduction of a new software tool:
To support the cooperative work the group tutor presents the computer supported cooperative work tool BSCW (Basic Support for Cooperative Work) to the group.

During the online phase, the group tutor is the contact person for problems or needs the students have independently from the content. The group tutor has to hold up the motivation and support her/his students whenever it is necessary. Furthermore, the group tutor moderates online chats which take place regularly. Further the group tutor interferes when any conflicts between the group members or the learner and the tutor appear which have to be solved. As the group tutor is in general during the whole distance program the same, tutor and students build up a personal relationship which supports the maintenance of motivation and drops the drop-out rates. Defining own group rules, norms and decision making processes is especially important at the beginning of the program and during conflict situations (Berge, 1995; Friedrich, Hesse, Ferber and Heins 2002).

According to notions of our students, the well-being in the own learning group is an essential aspect which leads to the satisfaction of the student program.

3.2 The subject tutor

The subject tutor is responsible for any concerns belonging to the subject, the tutor is specialized on. Normally, the subject tutor is responsible for one to two subjects. Every subject, e.g. communication or technique, consists of six different learning units.

The duties of a subject tutor are the following:

- Formulate the assignments for the different learning materials:
The assignments differ between single assignments and group assignments. As the students get the assignments for their own, the subject tutor has to create the assignments in this way that there is no misunderstanding possible.
- Correct the assignments and give feedback:
The subject tutor is responsible for correcting the assignments belonging to the subject, the tutor is specialized on, and also to give feedback to the student. If the students answered the questions of a learning unit right, he has to give credits on the assignments. Further the subject tutor has to ensure the learning progresses (Kerres, Nübel & Grabe, and, 2004).
- Contact to the author of the learning material:
As the content is in general not written by the subject tutor himself, he interacts with the author while (s) he is writing on the material. It is the duty of the subject tutor to define and control the contents.

Thus the responsibilities of a subject tutor can be distinguished in two phases: first the work on the contents before making them available to the student and second the support of the students while they are working with the material.

4 Communication between tutor and students

The communication between group tutors and students is based on synchronous and asynchronous tools. Synchronous events are helpful to support the social well-being of the learners. Thus, the learning group meets the group tutor in regular intervals in online *chats*. The groups either discuss organizational questions, e.g. who coordinates the next group assignment, questions concerning the latest studying material or just talk with each other.

Another way to communicate between the learning group and group tutor is a *group forum*². Each learning group owns its private forum where they can discuss different topics. In most cases it is used to answer group assignments. But it also includes topics, e.g. about literature, useful links or conferences. All threads are moderated by the group tutor.

Next to forum and chat, *E-Mail* is another very important communication tool between group tutor and learning group.

For the communication processes between the subject tutor and the students, *E-Mail* is the tool which is used most, especially to give feedback to the assignments. If the subject tutor has to correct a group assignment (s) he has also to look into the *learning group forum* to follow and judge the discussions.

The subject tutor and the group tutor communicate with each other, when:

- Problems/concerns arise with one student, e.g. (s) he has not able to answer a question for several times.
- A tutor receives a question from a student which should be answered by the other tutor.

² Chat and forum give the students also the opportunity to interact and help from student-to-student. According to Fahy (2003) support potentially benefits if instructors encourage students to engage in mutually supportive collaborative interactions.

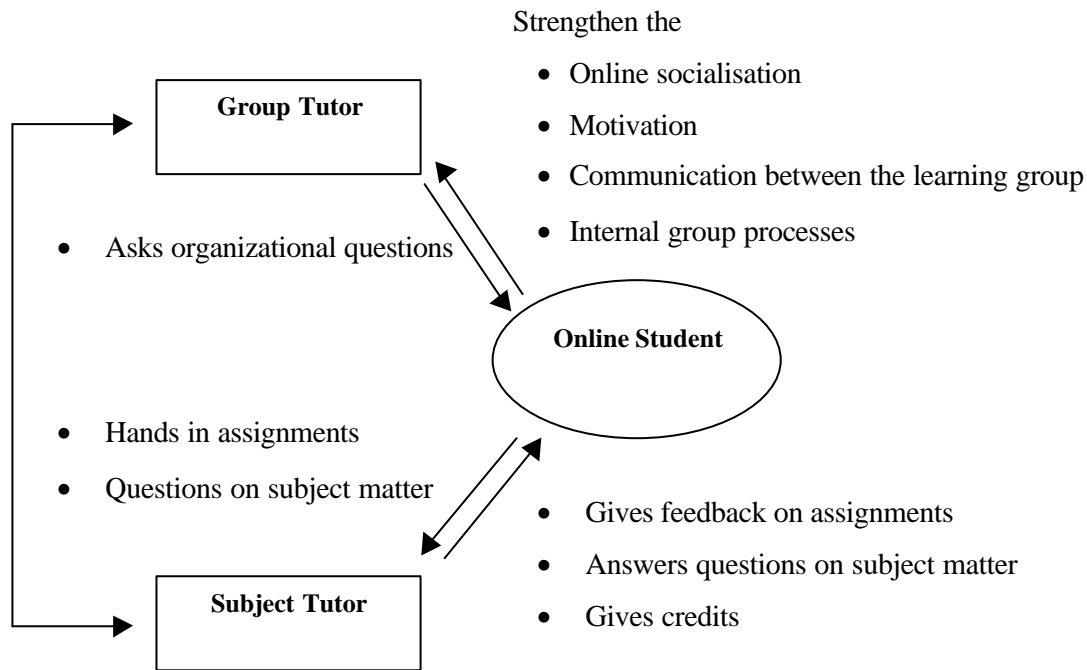


Figure 1: Communication between students and tutors

5 Advantages of different tutor roles

In our experience, the split-role model of tutors is rather easy to handle for our students. As the group tutor gets to know his students best, (s) he is able to step in if either a problem within the group or personal problem arises. The members of the learning group can address all questions and problem to a group tutor. If the question is concerning certain content, the group tutor would forward the question to the subject tutor. The students mentioned the allocation of clear responsibilities as very helpful.

The advantage of having different subject tutors is obvious: (S) He is deep into the content and is able to answer questions on the subject matter rather easily and right. Furthermore, the evaluation of the answers of few experts allows a consistent feedback over learning groups. Having worked for one semester with this model, our results show that students as well as tutors are very pleased with the split-role model of tutoring.

With this model we found an efficient alternative to the classical support model of universities which also allows the cognitive, affective and systematic support of the online student. The special advantage seems to be the chance to build up a more intensive relationship to the distance learner which is especially important at a study program that goes over several semesters.

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Authors:

M.A., Ilke Nübel
Universität Duisburg-Essen
Lehrstuhl für Mediendidaktik und
Wissensmanagement
Lotharstr. 65
47057 Duisburg
ilke.nuebel@uni-duisburg.de

Prof. Dr. Michael Kerres
Universität Duisburg-Essen
Lehrstuhl für Mediendidaktik und
Wissensmanagement
Lotharstr. 65
47057 Duisburg
kerres@uni-duisburg.de

THE USE OF CONTRACT LEARNING IN THE FRAMEWORK OF ONLINE-LEARNING – PRACTICAL EXPERIENCES AND RESULTS FROM EVALUATION

Ute Nunnenmacher & Thomas Jechle, University of Applied Sciences Furtwangen

1. Introduction

The following paper presents experiences made with the method of contract learning in the field of distance education for adults at university level. The method is rather uncommon in Germany and there are no well known examples of best practice so far.

Tele-akademie has gathered some experiences by using this method in the framework of a European project. Together with partners from England, France and Greece a new course in the field of training trainers was developed. Contract learning is obviously more common in the Anglo-Saxon and French learning culture; all partners benefited from the previous experiences of the French and English partners.

With our presentation we want to describe our model of contract learning in distance education and the practical experience of tutors and learners. We have found that learning contracts are excellent tools to enhance the quality and effectiveness of tutoring. Communication between tutors and learners can be improved by learning contracts. Learners have valued this method as a good instrument for self-directed learning. They appreciate the opportunity to define their own learning pace as well as their own learning objectives.

As an introduction we will give a short description of the concept of contract learning. Following we outline the Net-Trainers-course and present our model of practising contract learning. The main part will be the presentation of our assumptions and results concerning the use of contract learning as well as a description of challenges we have faced using this method. Finally we will present the conclusions we have drawn from this first practical experience.

2. The concept of contract learning

Contract learning is based on the principles of self-directed and autonomous learning. Following Peters (1997, p 139f) this method is one of the most forceful to allow students to plan and organise their learning autonomously. Contract learning enables students to make their own decisions concerning the curriculum and their learning path together with a consulting facilitator. It allows maximum individualisation of the learning process and is therefore judged to be most appropriate for adult learners.

“Contract learning is, in essence, an alternative way of structuring a learning experience: It replaces a content plan with a process plan. Instead of specifying how a body of contents will be submitted (content plan), it specifies how a body of content will be acquired by the learner (process plan)” (Knowles, 1986, p 39f).

To establish a learning contract, the learner is asked to reflect on his previous knowledge and to define his learning needs and interests. He will then define the learning objectives and the learning resources as well as the learning activities and the evaluation criteria. All these specifications will then be discussed with the facilitator who decides if the planning meets the necessary quality standards.

In practice, varying degrees of individualisation and autonomy can be found by using this method. As contract learning is a very flexible concept it is nearly impossible to organise it in a definitive classification system (cf Knowles, 1986). Generally there are three main aspects in the method of contract learning which can enhance learners immersion in their learning process:

1. When learners want to improve their competence in performing their jobs they must take into account the needs and expectations of their employers and their profession. These expectations do not automatically comply with the learning needs and interests of the learner himself.

Learning contracts allow the negotiation of reconciliation between external and internal needs and interests.

2. In traditional learning settings the whole learning process is structured by the teacher: The learner is told what learning objective he/she has to reach, what material to use and what activity has to be fulfilled up to a certain deadline.

This way of learning causes difficulties for certain adult learners: adults often have special learning interests relating to their jobs and their career. They have differing areas of knowledge and it might be interesting to some to go deeper into some topics and not into others. For this reason it is useful to allow a more self directed way of learning, so that the learner can decide what to learn, with what kind of material and in what depth.

3. Most adults have a very busy schedule including their job, family, social engagements, etc. It is much easier for adults to have a flexible time table for their learning.

Recapitulating it can be said (cf Hiemstra, 2003):

Contract learning can help:

- to identify learning needs.
- to specify personal learning interests and objectives.
- to decide on learning resources and strategies.
- to define deadlines for achieving learning objectives.
- to specify evidence of accomplishment, and how the evidence will be evaluated.

3. The Net-Trainers course

The whole online-course covers about 160 learning hours that are spread over a period of 6 months with an additional one month holiday in August respectively December/January. The primary audience of the course are trainers experienced in face-to-face training. Usually, within this target group the level of expertise as well as the time available for learning varies considerably. The learning interface has been designed for being accessible for visual impaired users, too. Hence, a method was needed that is flexible enough to cope with individual differences in learning interest, learning style and time constraints. The method that is supposed to fulfil these requirements is contract learning.

The course is available in three languages (French, English, German). Each language track is provided by one of the project partners. Partners for other languages are welcome. Starting the three language tracks in parallel provides learners with an opportunity to change the training language and provider for a part of the training. This change is called Europath.

The Net-Trainers training is split up into a pre-training module (module 1) and four main modules:

- Module 1. (pre-training module). The first steps in Net-training.
- Module 2. Concepts and challenges of Net-Training
- Module 3. Tutoring Net-Learners.
- Module 4. Designing Net-Learning materials.
- Module 5. Developing a Net-Training project

4. Contract learning in the Net-Trainers course

The method of contract learning is characterised by two main aspects:

- The learning contract itself
- Self-assessment and planning of the learning path

3.1. Learning Contract

The learning contract is set up at the very beginning of the training. Participant and tutor make some overall agreements for the training:

- Participants commit themselves to participate actively, to work in small groups and to document their learning activities in a portfolio.
- Tutors commit themselves to provide individual feedback and guidance within a defined timeframe.

The contract is signed by both parties.

3.2. Self-assessment and planning of the learning path

At the beginning of each module learners receive a questionnaire to reflect their previous knowledge in relation to the learning objectives of the training. They answer questions about their previous knowledge, their personal interests and learning needs. After evaluating their needs and interests they have a look at the learning material and learning activities proposed to them by the training provider.

Having in mind their personal aims and interests, they start planning their learning:

- What kind of learning material is relevant for them?
- What topic is interesting enough to immerse in?
- How much time do they plan to spend?
- When will the learning activity be completed?

They send their plan and self-evaluation to the tutor.

The tutor provides feedback:

- Is the selection of learning objectives well structured and realistic?
- Are there more objectives that could be proposed to the learner?
- Are there additional learning materials that should be worked through by the learner?
- Is the time schedule planned realistically?

The learner can then adapt the plan according to the feedback from the tutor. If the plan is agreed by both parties it becomes the central part of the learning contract.

This procedure is worked through at the beginning of each module. After the experiences of their first plan, learners reflect and identify factors to improve their skills of time planning and self-management.

4. Survey and Results

The results are based on data collected during the pilot training of the Net-Trainers course using questionnaires.

Assumption 1

The use of learning contracts encourages active participation by students. Students are more involved in their learning (cf. Anderson and Boud, 1996).

Results

Even though a contract might be viewed as something restricting in general, contract learning endows learners with a greater degree of autonomy because all major elements of the learning environment like objectives, contents and learning tasks are subject to an individual valuation and planning. Thus, learners are actively engaged from the very beginning of the course. Moreover, learners report that they make use of the learning contract to monitor their learning progress and to reflect on it.

In sum, since the learning contract emphasises the binding character of online training, learners feel more personally obliged in designing and monitoring their own learning process (see also assumption 3). Learners also feel more motivated when they have committed themselves to objectives and deadlines, which they have themselves defined.

Assumption 2

Online learning is sometimes suspected to be more anonymous than face to face classes. Indeed it is sometimes difficult for some learners, especially if they are not very self-confident, to express their needs and interests. Therefore it is sometimes difficult for the tutor to get to know these learners well enough for providing effective guidance.

Contract learning serves a tool for communicating learning intentions between learner and tutor. It provides a means for addressing the particular strength and weaknesses of each learner (cf. Hiemstra and Sisco, 1990).

Results

Contract learning is an excellent tool for the tutor to find out about learning interests and previous knowledge of the learners. Tutors gather a lot of information about the vocational background and the practical experiences made by the learners. All this information provides links for future exchanges regarding subject matters and the process of the learning itself. It provides more individual support and guidance to learners. All this information is exchanged systematically. This means that there are at least two improvements for the tutor: He or she gathers information from all of the learners, even from those that are not normally very communicative. All the information can be analysed and provide an overview of the individual profiles in the group.

Learners feel that it is a helpful instrument for communication with the tutor, to avoid misunderstandings and to express their aims and interests. They feel that their individual learning situation is considered to be important. Generally the learners feel that their needs and interests are taken seriously and they appreciate that they are recognized as individuals.

Especially incommunicative and shy learners are given a helpful tool by which they can express their needs and interests. It is helpful for all learners to develop a trustful relationship with their tutors, because it is easier to communicate subject deficits as well as learning problems.

75% of the learners find it helpful to receive feedback on their individual planning from the tutor. It provides them with the certainty that they are “on the right way” and enhances their self-confidence. Those who already have good subject knowledge and experiences in self-directed learning feel that they do not need the feedback of the tutor: In some cases learners can even feel patronised by the tutor.

Assumption 3

Contract learning involves the learners in making decisions about what will be learned, how it will be learned and when it will be learned. The process of learning is transparent for the learners and it is helpful for them to focus on their needs and interests (cf. Anderson and Boud, 1996).

Results

At the beginning of the course most of the learners find it difficult to make decisions about their learning process because they are not yet familiar with the subject field and the course structure. They rather focus on what is expected from them by the course provider than on what they are expecting

from the course. According to our experience it takes some time until learners can make the most out of this method. When the learners are used to it, most of them find it very helpful.

Learners appreciate the transparency provided by the learning contract. They are always up to date:

- What do they plan to learn next? (learning objectives)
- What is the learning progress? (achievement of objectives)
- What is the schedule (individual time planning)

It is seen as a means to become aware of their learning interests and to avoid dissipation of one's energies. It is seen as a helpful tool to structure the learning. Learners feel the method provides good assistance for self-directed learning.

Assumption 4

Learning contracts are an excellent tool for time and task management. It makes diverse duties more compatible with another: Learning can be harmonised with job-related as well as private duties.

Results

People appreciate the chance to plan their learning individually. They tell us that the learning contract eases the compatibility of job and private obligations as well as the course. They find it easier to stick to deadlines they have defined for themselves rather than if they were instructed by the tutor.

It has been a remarkable result of the questionnaires that the aspect of time and task management is the one the learners appreciate the most. 84% of the learners agree with the statement that contract learning supported them in their individual time management. Learners point out that they always have a clear survey of their relevant dates and duties. Some of them told us that they would not have done this kind of precise time planning without the method of contract learning but they found it very useful and helpful that they were asked to do it. Furthermore learners describe that the self structured time planning enhances their self-discipline and as a consequence they feel more highly motivated.

5. Challenges of contract learning

5.1. How can group learning be arranged with individual learning paths?

Contract learning focuses on individual learning interests and learning paths. It is meant to be very flexible. People are encouraged to plan their learning time themselves.

Conversely, group learning limits this flexibility. To achieve effective group activities learners mostly must work at the same time in order to reach a common goal. Our pilot training revealed the following: The German tutors fixed the times for group activities. This restricted the time flexibility for the learners, but lead to more efficient group work. Learners enjoyed the group activities very much and it was understood by them, that the flexibility was restricted for this very purpose.

Combining group learning with contract learning could be regarded as a balancing act. What we have learned from our experiences is that learners appreciate group learning even if it restricts their flexibility from time to time.

5.2. Some learners dislike contract learning for different reasons

This is a list of critical points mentioned by some learners:

- They feel that they are being permanently watched over.
- They do not want to commit themselves to deadlines.
- They feel that there is a lack of spontaneity.
- They feel that detailed time planning is a waste of time.

During the pilot training it has become obvious that it is helpful to give learners detailed information about the idea of using learning contracts at the beginning of the training. It is necessary to discuss their objections and to take them seriously. Otherwise learners could completely reject the method.

Furthermore it will be a challenge for future courses to design learning contracts as flexible as possible, in order to make them suitable for different types of learners.

6. Conclusions

Contract learning facilitates comprehensive preparation of the learning processes. Learners feel that contract learning makes learning purposeful and effective. They appreciate that they are asked to make deliberated decisions about what they want to learn when and why. They feel that the quality of self directed learning is enhanced by this method.

It is important to invest enough time with the introduction of the method. The method must be explained very well and there should be a period for the learner to gather some experience with this method (introductory module). Tutors have to discuss concerns and scepticism with the learners and they should encourage them to discover the advantages of contract learning.

Contract learning enables more individual support for learners. The procedure of self-assessment and the planning of the learning path is a way by which tutors and learners can develop a good pedagogical relationship. The exchange of important information and intentions is systematic.

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Authors

Ute Nunnenmacher
University of Applied Sciences Furtwangen, tele-akademie
PO Box 115278113 Furtwangen, Germany
nunnenmacher@fh-furtwangen.de

Thomas Jechle
University of Applied Sciences Furtwangen, tele-akademie
PO Box 115278113 Furtwangen, Germany
jechle@fh-furtwangen.de

THE FIVE COLUMN MODEL OF LEARNER SUPPORT – CREATING OPPORTUNITIES FOR GROWTH AND CHANGE

Karen Beyer & Marion Bruhn-Suhr, Universität Hamburg

Abstract

This paper describes the holistic approach of adult learner's support for blended learning opportunities developed and put into practice by the centre for continuing education and distance learning of Hamburg University (AWW). The concept can be visualised as a five column model based on a support team which serves authors, moderators and students alike. This is complemented by a continuous training and updating concept in order to keep guaranteed quality standards. We report on the results and outcomes following the evaluation of the first pilot-phases.

General framework

The blended learning programmes offered by the AWW are developed within the project OLIM¹ for adult learners with a first university degree and at least one year working experience (Beyer, Bruhn-Suhr, Hamadeh, 2003, pp. 15). As the delivery of education through the world wide web promises many advantages for adult learners, the preparation for teaching and learning in cyberspace was (or is?) neglected to some extent (cf. Goody, 2000, p. 1). The design of our programme takes several crucial areas of online learning into account:

- Not only students, but also instructors/tutors need special training and qualification in order to cope with typical demands and standards of online teaching (cf. Salmon, 2002, pp. 189).
- Individual learning competencies are essential for successful e-learning-processes and academic achievement (cf. Ehlers, 2002, p. 1). This is a well known statement about distance learning or even learning in general.²
- If students have not learned to interact in a virtual environment, there is the danger of disorientation, isolation and finally of student's drop outs (cf. Goody, 2000, p. 3). Students (and teachers as well) have to feel comfortable with the technology!

To cope with these potential risks, we found the following five columns to be essential components for learner support aiming at successful learning process.

The concept of learner support

Column 1: student information system and general administration

There are various definitions of "e-learning" which make it difficult for potential students to judge what they can expect. On the one hand "e-learning" is used as a term for any kind of learning with electronic media, on the other hand it is used in order to differentiate from CBTs or videoconferencing (cf. Reglin, Severing, 2003, p.18). Our e-learning concept relies on substantial proportions of virtual group work. We have to make sure that our students are prepared to commit themselves to contribute to groups, stick to agreed dates and agendas and are not expecting "game-like software". The modules are of university level (including the need to read theoretical papers and texts). One of the major learning targets is the transfer from theory to practice.

¹ OLIM stands for „Online Perspektiven im weiterbildenden Studium“ (cf. Beyer, Bruhn-Suhr, Hamadeh, 2003, pp. 15)

² Traditionally, competent distance learning providers try to improve their students' learning skills by a set of various offers such as introductory texts or seminars (cf. STEB – Studieren an der FernUniversität or Northedge, 1990, or McLoughlin, 2002, pp.1). A student seems to have a good chance to be a successful distance learner or e-learner, if he or she is highly competent in self organised learning.

Detailed information about the programme of study is provided online. This includes information about the contents, the learning targets, learning organisation, timetables, credits, assessments, certification, costs and the minimum standard of technical equipment. There are opportunities for online registration and contact details for individual questions etc. The general administration is organised in as much customer-oriented way as possible.

The evaluation of our first pilot runs quite clearly demonstrates that some students had expected less group work and discussion forums. Clarifying our definition of e-learning shortly before the start of the second run led to quite a few cancellations. Consequently very detailed descriptions on the website are crucial if we want to make sure that on the one hand we address the target group we are aiming at and on the other hand potential students know what to expect.

Column 2: teaching, facilitation, and moderation

Today e-learning experts seem to agree, that (good) moderation of e-learning-courses is crucial for success.(cf. Bremer, 2003, pp. 191). Students who enrol in our blended learning programme do not expect classical computer based trainings, but a learning environment where they can work with others, contact tutors whenever needed and are supported in the learning process in general. The student ought to feel part of a learning community. Discussions are moderated and students' group work is supervised by our especially trained teachers. All of this creates a "classroom feeling" which helps to overcome some of the typical problems of distance learners, such as disorientation or isolation (cf. Schulmeister, 2001, p. 201, Kerres, 2001, pp. 263, Elsener, 2002, pp. 299).

Our first pilot run showed, that the manner of teaching or moderating a course had a huge impact on the learning process, perhaps a bigger impact than the general course design and learning arrangements. During the process of moderating the courses our teachers reconsidered their roles: They reflected on questions such as *How much guidance should I give? Or How often, how much should I intervene in groupwork activities?* This corresponds with feedback from our students who were highly satisfied with the amount and quality of teaching, facilitation and moderation they received. Also most of them had felt part of a learning community which was motivating on the long run. However some of them would have done with less guidance, others asked for even more guidance and moderation. The latter was feedback from students who felt, group activities had not been as successful as they had hoped (cf. Bremer, 2003, pp. 191).

Even though most students approved of the e-moderators, to us it seems, teaching, facilitation and moderation can still be improved. On the one hand we still need to adjust the concept even better to the different needs of individual students and student groups. On the other hand students have to be informed even more carefully what to expect from the teacher and what is expected from them in order to meet the learning targets. Moreover there is a certain responsibility on our side to facilitate the individual student's development towards a self-confident learner. In addition we have to find a good balance between the amount of moderation and support provided and financial restrictions (how much are our customers willing to pay for the product?).

Column 3: course choice and general guidance

Based on the long experience as centre for continuing education the AWW staff is well trained for advising and supporting adult students in questions regarding the prerequisites for taking a blended learning module, the course choice and general guidance for blended learning opportunities. All kinds of communication is involved: email, telephone, face-to-face meetings.

The number of telephone calls referring to our first E-learning pilot was quite impressive: Over 50 calls in comparison with about 70 enquirers. Most information asked for was definitely available on the website. No significant decline in the number of phone-calls was observed for the second pilot despite the revised and adapted web-publication. Can this be interpreted as the wish to find out about the human aspects behind the e-learning?

Column 4: the “Study Skills” module for students

In order to prepare students for the special needs of e-learning the AWW has developed a special module, “Study Skills”, which is compulsory for any student taking his or her first blended learning module at the AWW. There will always be a run of this module before any of the other modules start.

By touching a wide range of relevant topics we try to make sure that the students know what they let themselves into. Our “toolbox” for successful study starts with an introduction to the learning platform and its use, because students ought to feel familiar with the learning environment before they move on to their other modules. Furthermore the following topics are presented, discussed and/or experienced:

- time management issues,
- web based group work,
- web-related communication skills,
- IT-skills,
- Reading and note-taking
- basic knowledge of learning styles and their influence on efficient learning individually and in groups

These topics are all related to the well known topics “traditional” distance learners have to cope with.

The module starts with a face to face session, runs over three weeks and is moderated at a very low level. This “toolbox” is open to the students while they are moving on with other modules so that they have the opportunity to go back and reflect on issues which they or fellow-students might have dealt with before or which might come up again during their study experience.

More than 92 % of our pilot students stated they reached their personal goals, and moreover they would recommend “Study Skills” to any other student who needs to gain familiarity with e-learning, teamwork online, the learning platform and its tools etc. Some students stated that they had not believed in any benefit because of previous study experience but afterwards they realised how little awareness they had had about possible pitfalls. Apparently, most students could easily cope with technical and/or other e-learning related problems in subsequent modules. This is for instance illustrated by the fact that our experts were hardly contacted for technical advice once the students had completed “Study Skills”.

These results underpin the idea of offering “Study Skills” as a compulsory introductory module. However, the devil is in the nuts and bolts which is difficult to detect and/or evaluate: Have the students really learned to cope with all kinds of typical problems related to distance learning? Or less ambitious: Have they become sensitive to certain issues such as time management, virtual group work, or asking support if needed? What level of competence did they start with, and what did they really gain during “Study Skills”? Was there really a growth in competence achieved by working through “Study Skills”? And last but not least, have we met specific needs of individual learners? Or – how can we possibly meet them, if there is a wide range of such needs? For instance, some learners wish more literature, links and texts related to the course topics. Others recommend less “information overflow”.

Also, some student’s questions and comments illustrated that important information had not been read at all. So how can that information be arranged and presented in order to reach the student just in time?

Hence on one hand, the “column 4” - the “Study Skills Module” - worked out well for the students. On the other hand there are still many details to be looked at again carefully in order to further improve the “Study Skills” module, details such as the general course structure and learning arrangements, compulsory and optional sections, and the kind of learning tasks. It seems, that once again it is the distance education expert to be consulted, because topics such as “information overflow”, “ignorance of study guides” etc. are well known from traditional distance learning.

Column 5: technical support including technical hotline

Before the students start with our blended learning modules they are guided to check and prepare their technical access to the learning platform. Whilst studying there is technical support provided by the computer centre of Hamburg University in all questions regarding the administration of the learning platform as well as general questions of platform access. Within the project the computer centre in co-operation with the AWW jointly developed the competence and the structure for a hotline.

If there are questions regarding the individual modules there is a contact person within the AWW who will help with those questions that cannot be answered by the moderators of the modules or the hotline.

When our very first blended learning course, “Study Skills”, started with 34 students, 22 more or less “technical” questions reached the technical support team (hotline and/or contact person within the AWW). During our second pilot run of “Study Skills” with 70 students there were only 20 such questions. We conclude that within the 13 weeks of the two presentations the module as well as the platform had been improved. During both runs quite a few questions dealt with access/log in or with browser configuration; some questions were related to the handling of platform tools. Once the “real” modules started, hardly any technical advice was asked at all; students could concentrate on the content of their courses.

For teachers as well as students it was essential to rely on experts to deal with technical problems. “It was quite comforting to know, there is someone there to help” is a student’s statement. However, it became obvious, that students (with any kind of technical problem) preferred to contact the personally known AWW-expert rather than calling the anonymous hotline. This urges us to improve the presentation of the hotline or even to present the experts that “are” the hotline. Another fact became obvious as well: Students can hardly differentiate between technical or other problems related to the module on one hand or related to the platform on the other hand. Therefore from the customer’s point of view organisational barriers should be kept as low as possible.

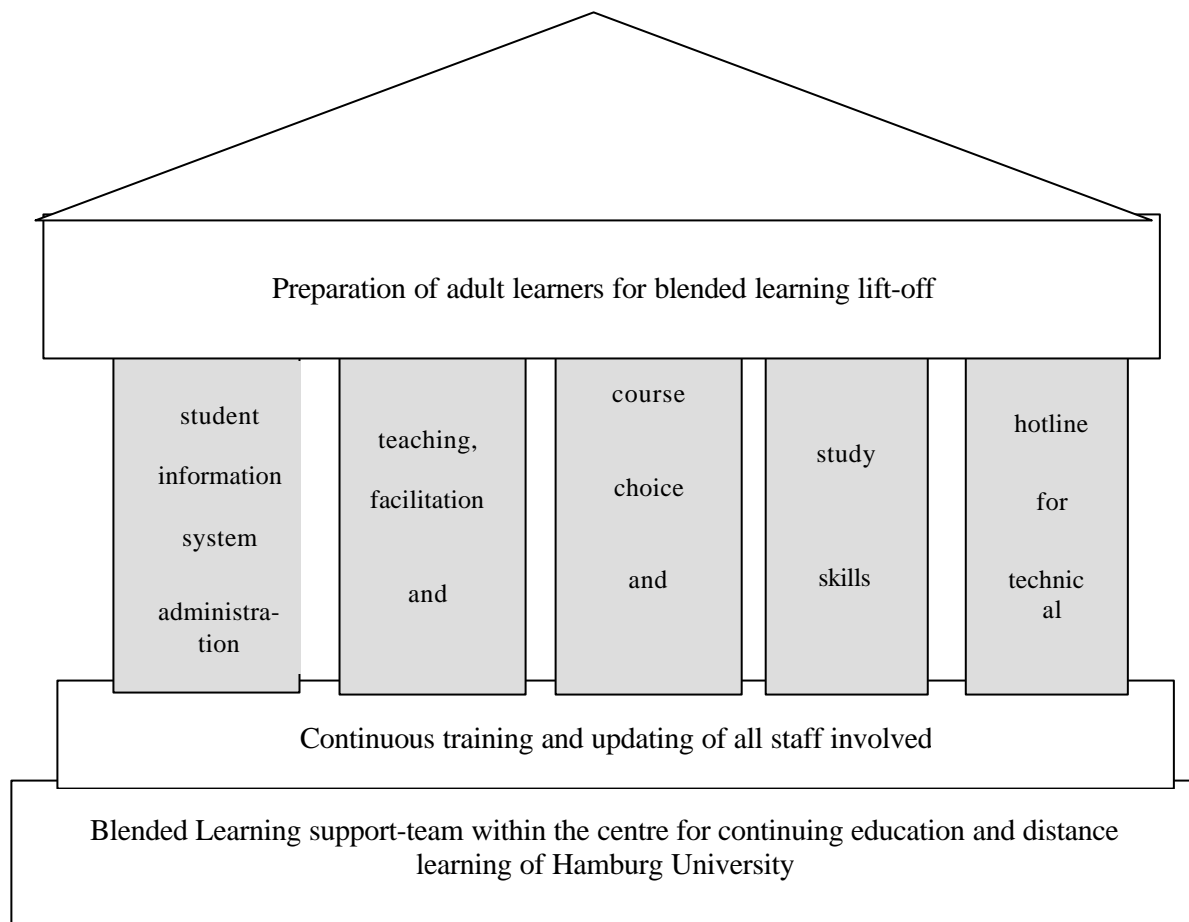


Figure 1: The five columns of student’s support

Solid base: teamwork and training

The solid base for the five columns consists of two important layers: one consists of a team within the AWW including

- those who manage and co-ordinate the development of blended learning modules,
- those who support the authors (in general professors from Hamburg University and their staff and part-time lecturers) in didactical questions and
- those who provide support in technical issues.

The second layer deals with quality issues, continuous training and updating authors and moderators for the special needs of our blended learning modules and learner's support.

Our authors, moderators and/or facilitators are especially trained for blended learning opportunities. Part of the training is the so called "Train-the-E-Trainer", a module that covers the basics for authoring, designing, moderating and the basics for technical support. This training has severe impact on the development of content and structure of all other modules. Although the special qualification of our moderators is one of our quality standards we took the opportunity to observe the difference between moderators with and without the special qualification within the pilots to ensure that we really have to invest in the qualification of our moderators (cf. Rautenstrauch, 2001, pp. 22 and Salmon, 2000, 2002).

Moreover our modules need to be relevant for the workplace situation of our students. This is accomplished by involving representatives from business who deliver case material and case-studies and provide feedback on the content and design of modules. They work on a secondary contract basis and are involved right from the beginning of the module development (cf. Beyer, Bruhn-Suhr, Hamadeh, 2003, pp. 22).

Following our own quality standards also means that we keep track of international blended learning developments and standards and update our modules correspondingly. The same applies to the contents of existing modules. Continuous evaluation is and always will be a vital part of the quality process in all aspects. This is to ensure the learners get the support they need to create opportunities for growth and change.

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Authors:

Karen Beyer
Dr. Marion Bruhn-Suhr
Universität Hamburg
Arbeitsstelle für wissenschaftliche Weiterbildung
Vogt-Kölln-Str. 30, Haus E
22527 Hamburg
olim@aww.uni-hamburg.de
www.aww.uni-hamburg.de/olim

ONLINE COLLABORATIVE TOOLS IN A VIRTUAL ENVIRONMENT & THE DISTRIBUTED LEARNING RELIANCE & INTEGRATION MODEL

Margaret Halliday & Karen Riedel, Royal Roads University

Introduction

The global nature of the Internet makes it an ideal medium for those who wish to retrain or continue a course of study. Many of these individuals are people who have families and commitments that prevent them from relocating to continue their education or job training. However, learners using the Internet do not have the opportunity for face-to-face interaction nor do many of these geographically separated learners receive the support they require. We believe online collaborative tools will aid in overcoming these two issues and the Distributed Learning Reliance and Integration Model (DLRIM) provides a holistic approach for integrating online collaborative tools into the distributed learning (DL) curriculum.

The first section of this paper outlines the DLRIM and its relation to online collaborative tools. The second section examines the benefits of online collaborative tools and the third section describes the implementation of these tools. The fourth section looks into some of the support issues of the e-Learner.

Distributed Learning Reliance and Integration

Using online collaborative tools and other technological advances in DL presents many challenges for institutions, their faculty and support staff, and their learners. These challenges include:

- consideration of the technological capabilities and levels of learner expertise when developing online programs
- provide for adequate training of faculty, staff and students for the successful use of online collaborative tool(s)
- appropriate staffing levels to provide the required technical support
- appropriate allocation of financial resources
- adequate training and resources for online curriculum development
- ensure that future planning for DL is an integral part of the strategic planning process

Restructured curriculum development strategies and instructional methods take advantage of new technologies but responsibility for the success of DL programs remains with faculty, staff, and administrators who are *partners*, not just divisions, in the educational system. This idea of restructured curriculum development and the structural changes in the management and organization of teaching is supported by Bates (2000, p.28).

Technology allows institutions to deliver education globally, to reach out to the continuing professional education market, and to change the organization and program delivery methods. These allowances will not happen without institutional reorganization and cultural change. Transition to online learning requires a rethinking of organizational priorities and structures. Computing services, audiovisual departments, distance education support services, teaching development centres, and telephone services are distinct entities within the institutional structure that often have limited interaction. Integration and coordinated planning for these institutional components was considered essential to successful participation in distributed learning (Martin, 1998). Martin discussed senior leadership issues, where institutional presidents and vice-presidents learn early in their careers not to

alienate powerful academic leaders if they want to have any of their priority goals supported. Gallagher (as cited in Martin, 1998) suggested that senior administrators often appear supportive of new initiatives in principle but are reluctant to commit to any major reallocation of limited institutional resources to enable the initiative to succeed. The issues of transition to online learning, leadership, responsibility for success of online programs, staff and faculty training, and technological infrastructures requires an integrated approach by all players since each relies on the other to be successful.

To achieve a holistic approach to the implementation of online collaborative tools, or the implementation of DL programs in general, institutions should consider how they operate from a whole systems view. Halliday (2002, p.89) concluded there are six commonplaces in an institution that must work together to create the best possible educational experience for learners. The original Distributed Learning Reliance and Integration Model (DLRIM) combined Support Staff and Technologies as one commonplace, but since technologies are the basis for distributed or e-learning initiatives it is reasonable to separate this area into two parts, thereby increasing this number to seven commonplaces as shown in Figure 1.

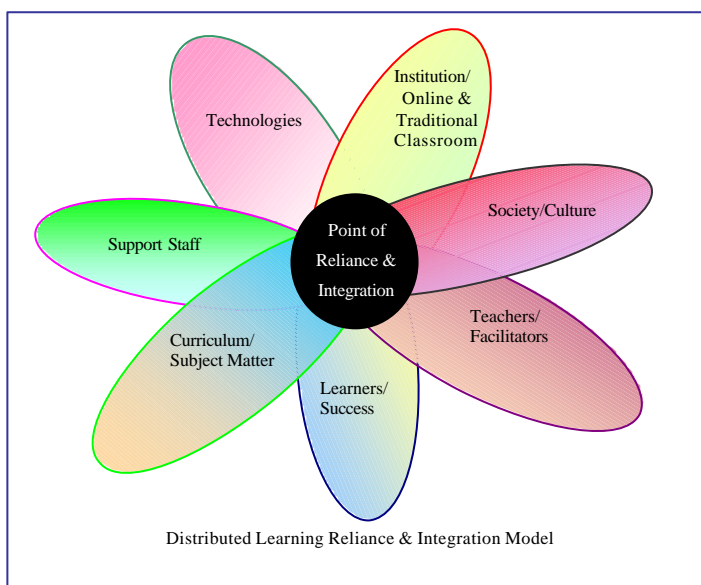


Figure 1 Distributed Learning Reliance & Integration Model (2003)

The DLRIM clearly illustrates the seven commonplaces of an institution work synchronously. Understanding this synchronicity is essential, because for one area to be successful, all others must contribute to its success. Should one area fail, all other areas will suffer, thereby compromising the success of the learner (Halliday, 2002, p.91). Although these areas work together at different levels of activity the reliance of each on the other is significant. To understand this reliance and integration, consider the writing of Senge et al. (2000), in *Schools That Learn*. Applying the fifth discipline of 'systems thinking' provides a different way of looking at problems and issues, not in isolation but as integral components of a larger structure. The word 'system' comes from the Greek verb *sunistanai*, which means 'to stand together'. With this term in mind, implementation of a system-wide approach within an institution would uncover innovative ways to improve support systems for learners, and strengthen collaboration between the areas of the DLRIM. This approach develops awareness of complexity, interdependencies, change, and leverage (p. 77-79). The whole system approach encompasses all aspects of administrative, technological, cultural, programme and evaluation, and support issues whether using DL or traditional delivery methods. The evolution of the traditional hierarchy of an institution into a 'learning organization' will require a fundamental shift of thinking about every aspect of institutional life. We believe this shift will create a stronger more vital, more energized educational institution.

With specific consideration to online collaborative tools, this holistic approach can:

- provide sufficient professional development opportunities for faculty and support staff who use online collaborative tools in program development and delivery
- strengthen the support mechanisms for online learners using online collaborative tools
- improve online curriculum development and evaluation strategies
- incorporate online collaborative tools in program development where appropriate
- bolster technological infrastructures to support online collaborative tools
- provide faculty and learners opportunities to interact with their peers
- improve methods of access to student services and even enhance institutional credibility

Online Collaborative Tools

Online collaborative tools provide a means for learners to interact, to refine critical thinking skills, to stimulate the formation and growth of a community, and to work collaboratively. Increasingly, online collaborative tools are becoming important components of the Internet and Web-based learning and work environments (Brown, 2001; Riedel, 2002; Stacey, 1999). These tools include, but are not limited to instant messaging, chat, e-mail, and Voice-over-IP (VOIP) systems such as NetMeeting, HorizonLive, WebEX, Centra, and GROOVE (Riedel, 2002). Online collaborative tools allow learners to interact easily with each other, either synchronously and asynchronously, and form communities of learners or peers. “A fundamental requirement of these tools is that their related technologies can facilitate, augment, and even redefine interactions among members of a work group” (Driscoll, 2000, p. 393). Online collaborative tools also provide the means for geographically separated students to engage in similar types of networking and discourse that one would find in traditional face-to-face courses (Riedel, 2002, p.68). Chute, Thompson, and Hancock (1999) also indicated “the main benefit of online collaborative technologies that support collaborative work by geographically separated participants is that it will allow team learning with the learners and instructors sharing responsibility for structuring and maintaining the learning process” (p. 207). In a PBS television interview, Dr. Michael Catchpole stated, “I don’t think students are educated if they only have content. They need to debate and interact with the professor, with the content, and with each other. In distance education, there are lots of opportunities for interaction. That’s one of its real strengths” (PBS, 2001). When learners and faculty use online collaborative tools, there is the ideal opportunity to use new knowledge. Hiltz (as cited in Stacey, 1999) stated, “The social, affective, and cognitive benefits of peer interaction and collaboration, which had previously been possible only in face-to-face situations, were now possible with the medium of computer communication” (p. 10). The views of Catchpole are further substantiated by the research of Riedel (2002) who examined the use of online collaborative tools in an online Masters Degree program. Her research indicated learners, faculty, and members of the instructional design and technical teams viewed the use of online collaborative tools as essential and indispensable to online programs (p. 66).

Institutions tend to use more technology to fix or improve the on-line experience, without addressing many of the actual problems of software support, training, and product usability. Bates (2000) pointed out that teaching with technology is not something to be picked up along the way or done off the side of a desk. “Learners must feel comfortable with the technology and know how to use it effectively” (p.91). For example when institutions decide to implement a learning management system such as WebCT or other delivery platform, which may include online collaborative tools, often there is little consideration given to the time required to train and support learners and faculty to use the tool. This lack of training and support results in frustration for learners and faculty members that translates to frustration with the online program. Instead of fixing the problem of training, institutions tend to spend more money on other technologies or implement Band-Aid solutions to solve the problem. In fact, this lack of attention to training and support will ultimately cost more money, with the original underlying problem remaining unsolved. If the institution is unable to provide an optimal learning experience then potential learners will seek out other more attractive alternatives (Riedel, 2002). The DLRIM would be a mechanism to address such issues and mitigate these problems.

Implementing Online Collaborative Tools

- Institutions need to examine the implementation of DL and use of online collaborative tools in a holistic manner. Prior to implementing any online collaborative tools, an institution must first define its institutional definition of distributed learning. Once that definition is in place, it is easier to select and implement the online collaborative tools whose attributes are consistent with the definition, and that best meet the needs of the institution and the programs offered. When an institution is at the stage to implement online collaborative tools, Bates' (1995) ACTIONS model provides valid questions to consider prior to implementation:
- Access - How accessible is a particular technology for learners? How flexible is it for a particular group?
- Cost - What is the cost structure of each technology? What is the unit cost per learner?
- Teaching and learning - What kinds of learning are needed?
- Interactivity and user friendliness - What kind of interaction does the technology enable? Is it easy to use?
- Organizational issues - What are the organizational requirements and barriers to be removed? What changes in the organization need to be made?
- Novelty - How new is this technology?
- Speed - How quickly can courses be mounted with the technology? How quickly can materials be changed?

A balance of variety with economy and interaction is essential. New technologies are not necessarily better than old ones, teamwork is essential and faculty training to use technologies effectively is especially important. By answering the questions set-out by Bates in his ACTIONS model and by using the collaborative tools checklist developed by Riedel (2002), which is available at <http://www.dltoday.ca/Portfolio.htm>, and examining the comprehensive list of online collaborative tools located on the Athabasca University website (<http://cde.athabascau.ca/softeval/products.htm>), an institution can begin to determine the real cost of implementing educational technologies, including the online collaborative tools to be selected. Bates (2000, 16 July) indicated there are major financial implications for universities and colleges seriously wishing to use technology for teaching (Barriers to change, ¶ 4). In addition, there is a steep learning curve and large hidden costs in time spent by professors when using new technologies (Bates, 2000, p.19). A conservative estimate based on best practice examples is that at least 5% of the total teaching budget needs to be spent on technical and instructional support for staff and professors (Barriers to change, ¶ 4). With this in mind, we suggest that institutions develop a strategic dedicated resource plan for purchasing and continual improvement of online collaborative tools. This dedicated resource allocation would also provide for future program expansion, thereby ensuring funds are available as DL programs evolve.

When institutions select or implement online collaborative tools we recommend they create a database to track:

- learner and faculty support issues
- expenditures of time and money
- how the online collaborative tools performed
- technological difficulties
- other types of related information that the institution wishes to capture

Integrating online evaluation and analysis of collaborative tools into DL programs, institutions will be able to compile learner, faculty, and staff viewpoints in order to document successes. The database will also provide a baseline for comparison of the entire program as it evolves and develop best practices for using online collaborative tools. This ongoing process will be instrumental in deciding whether and how implementation for improvement to either online collaborative tools or support networks is undertaken.

Support and the E-Learner

Institutions must examine student support issues from the students' viewpoint, as well as from the commonplaces of the institution in order to make viable and cost-effective changes and improvements to DL programs. The need to support learners throughout their learning journey was summarized by Granger and Benke (1998), “the overarching lesson for every aspect of distance learner support is: know your learners, know who they are, where they are, and what’s available to them” (p. 129). Granger and Benke also said successful learner support comes from every part of the program, from the first awareness of a program to graduation day. Therefore, there needs to be an integrated approach to maintain the learner’s engagement. “Too often, virtual education has been approached as a technical solution to distance, without considering that, for the student, the nature of the educational experience is a function of the opportunities for thinking and learning” (Ryan, 2001). The decisions regarding technologies are vital as the target audience must be able to use the technology and the institution must have the infrastructure to deliver and support the online program. The suitable integration of technological infrastructure in conjunction with trained individuals in DL course development techniques will increase the quality of these programs. Teachers and facilitators are the subject matter experts who work with instructional designers to develop these programs; therefore, the instructional designers require training in distance education pedagogy and teaching techniques, and teachers and facilitators require a grasp of instructional design methods. Likewise, staff who support learners, teachers and facilitators with technological and delivery issues requires training in DL methods. These groups rely upon one another for support, but they also must have the availability and commitment of institutional resources to be successful in their work.

Conclusion

In the age of e-learning and global learners, online collaborative tools are essential to any program delivered at a distance. We believe the implementation of DLRIM will provide institutions with a mechanism to properly include and support online collaborative tools in DL programs. In addition, the model will provide a holistic approach to develop the seven commonplaces of an institution, which include but are not limited to; dedicated leadership and commitment, funding allocations for resources and technologies, support and training, curriculum development, and cultural diversity for successful distributed learning initiatives. The measured acceptance of new ideas and the desire for action sometimes collide. Every participant within the areas of the DLRIM, whether they advise, administer, develop, implement, evaluate, or support distributed or e-learning initiatives, must recognize and acknowledge that they are part of a collaborative process and must not work in isolation.

Using online collaborative tools, learners from all countries experience different cultural perspectives that enrich their educational experience as well as foster communities of learning and practice. Supporting these learners necessitates striking a balance between support services for all learners and tailoring support for DL learners. To achieve this balance of support services and other DL requirements a framework for DL implementation must be based on a set of guidelines, criteria, or questions to ensure the quality and deliverability of DL programs and courses (Halliday, 2002, p.21). The Canadian Recommended e-Learning Guidelines (Barker & CACE, 2002) and/or the Best Practices for Electronically Offered Degree and Certificate Programs (Western Interstate Commission for Higher Education, 2001) can be used as a baseline to assist institutions in creating guidelines to successfully integrate distributed learning into the fabric of the organization. This combination of well-conceived guidelines and the adoption of a 'systems thinking' or 'whole-system' approach will provide institutions with a foundation to develop and implement quality DL programs.

Collaboration, reliance, and integration between the commonplaces of the institution will improve the distributed learning experience for everyone. As the hockey legend Wayne Gretzky said, “I skate to where the puck is going to be, not to where it has been” (Rosenberg, 2001). To get to where distributed learning will be, institutions must implement formative and summative evaluations of institutional strategies, support mechanisms, instructional design methods, program implementation plans, evaluation methods, and technological infrastructures to revise and improve their distributed learning initiatives.

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Authors

Margaret Halliday, MA (Distributed Learning)
E-Learning Specialist in Distributed Learning Development
1992 Fairway Drive
Campbell River, British Columbia V9H 1R6 Canada
mehalliday@telus.net

Karen Riedel, MA (Distributed Learning)
E-Learning Specialist in Online Collaborative Tools
43 Knollwood Road
Victoria, British Columbia V9B 1E4 Canada
kriedel@shaw.ca

DEVELOPMENT OF A MODEL OF ACADEMIC LEARNER SUPPORT SERVICES FOR DISTANCE EDUCATION PROGRAMS FOR HIGHER EDUCATION

Nancy J. Mactague, Aurora University

Introduction and Statement of the Problem

As stated on the EDEN Conference website, “[l]earner support is central for success in education and training in general, and in open and distance learning (ODL) in particular.” As a result of the increasing popularity of distance education and the growing diversity of the learner population new models of learner services must be developed to meet the needs of specific groups of learners in a wide variety of educational environments (Garland & Grace, 1993, p. 83; Newman & Peile, 2002, p. 200; Schroeder, 2003, p. 55). The nature of distance education places all students into a learning environment that offers little opportunity for contact with fellow students, faculty or administrators (Boyle & Boice, 1998, p. 92). Therefore, the goal of a program of academic learner support services for distance learners must be to meet the needs of this special group of learners by linking them with fellow students, faculty, and administrative personnel (Potter, 1998, p. 75). Providing services to assist the student in developing into an independent, self-reliant, confident learner who can manage both pedagogy and institutional procedures can achieve this goal. Support services must be provided to personalize and humanize the institution, so the student views it not as a faceless bureaucracy, but as an entity to which he/she “belongs” (Dewitt, 2003, p. 756).

Learner demographics have changed dramatically since learner services theories were originally developed. Those theories were based on a student body dominated by white males aged 17 to 22 years of age studying in a campus-based environment (Garland & Grace, 1993, p. 81). Women now outnumber men in total higher-education enrolment, and other minority populations are increasing as well (Garland & Grace, 1993, p. 27). One-fifth of students enrolled in 2- and 4-year institutions in the 2000-2001 school year were enrolled in distance education courses (Watts, Lewis, & Greene, 2003).

When dealing with today’s diverse learner population, neither the use of a generalized model nor the employment of a mass services strategy will be as “effective as matching the model and intervention with” the learner or learner subgroup (Garland & Grace, 1993, p. 86). Services must respond to changing learner types and characteristics, and attention to learners must be integrated into institutional priorities (Garland & Grace, 1993, p. 27). The purpose of this paper is to provide a template for use by other institutions through outlining methodology that was used successfully to develop a model of academic learner support services for Programs for Higher Education, and through discussing the structure of the resulting model.

Nova Southeastern University’s (NSU) Programs for Higher Education (PHE) offers the Doctor of Education degree to learners worldwide in a field-based cluster format. Learners may join clusters in October, January or April. Administered by cluster coordinators, and taught by full- and part-time faculty, clusters meet only once per month for coursework from October to May and for one or two weeks each summer. Therefore, most communication is electronic, and most coursework and all research projects are undertaken at the learners’ workplaces. All research projects must resolve real-world problems encountered at the learners’ workplaces.

PHE learners were dissatisfied with the academic learner support services they were receiving. This was highlighted in Wilson’s (2000) research into the need for a new orientation program for PHE, and in the Graduate Student Council meeting held at the 2000 Summer Institute in Tucson, Arizona. Learner support was one of the items specifically identified as a student concern and a requested action item (Graham, 2000). Learners expressed the highest levels of need for support in the following areas: psychological self-aid and buddy care, how to engage in scholarly writing, how to prepare for

the comprehensive examination, how to use the electronic library and how to understand the APA style manual (Mactague, 2000).

Review of the Literature

Adult learners turn to distance education because its anyplace/anytime nature allows them to juggle the demands of family, work, and school (Kemp, 2002, 66, 76). Adult learners want to be in control of their own learning, but often have no one from whom to seek help in resolving learning difficulties (Venkaiah, 1995, p. 15). Adult distance learners must overcome social and academic isolation to achieve educational success. Learners who do succeed have come to feel they “belong” to their institution, while also developing autonomy and independence (Boyle & Boice, 1998, pp. 87, 91).

Distance education meets adult learners’ needs by offering them a high degree of independence through delivering educational opportunities at the learner’s own time and place. Transcending both time and geography, distance education can provide greater access for those who cannot attend on-campus classes (Paul & Brindley, 1996, p. 43). Distance education may allow learners the flexibility to decide where and when to learn, how quickly or slowly to complete a course or an entire program, or when to take a break from learning. Learners choose to participate in distance education because of the convenience, flexibility, access, and adaptability that distance education offers to meet their individual needs (Holmberg, 1995, pp. 13, 15).

Distance education falls short in meeting learners’ needs in that learners exist in a state of social isolation (Paul & Brindley, 1996, p. 43). Distance education is at the opposite end of the spectrum of personalized teaching from the traditional Cambridge and Oxford Universities’ systems in which tutor and student work together in a one-on-one relationship (Holmberg, 1995, p. 16). Social isolation, inadequate faculty attention, and lack of learner support can result in high dropout rates (Jung, et al., 2002, pp. 154, 160; Paul & Brindley, 1996, p. 43).

Traditional campuses offer a more personalized form of educational opportunities, as well as a wide variety of academic student support services. Distance learners require, but often do not receive, the same level of academic support that is offered to on-campus students. Distance students must be provided access to the services offered by admissions, registration, and records; financial aid and business offices; computing services; the bookstore; the library; advisement; personal and career counselling; social activities and placement (LaPadula, 2003, pp. 126-128; Simerly, 1999, p. 44).

Methodology and Procedures

Design Phase

A literature review and learner needs survey were undertaken concurrently. The literature review included the nature and needs of adult learners, the nature of distance education, academic learner services program design, and sample formats from academic learner support services programs offered by other institutions offering distance education opportunities.

Learner needs data were gathered qualitatively and quantitatively through focus groups and surveys. Three hundred surveys were distributed to a sampling of 175 students, 75 staff, cluster personnel, or faculty, and 50 alumnis. The survey return rate was 63%. Four focus groups included a sample of PHE cluster students, cluster administrators, faculty, and/or alumni. Results of the literature review, surveys and focus groups were used to formulate the criteria for the development, future implementation, and evaluation of the model of academic learner support services.

A formative committee, made up of NSU PHE students, faculty and alumni, and a summative committee, made up of outside experts in the fields of distance education and academic learner support services, reviewed the criteria. The criteria were then grouped together according to the timing of the learner’s need for service, the type of service needed, and the provider of the service (Potter, 1998, p. 63). The model of academic learner support services was drafted based on the criteria developed with

the input of the committees, the results of the literature review, and guidance by the methodology and procedures employed by Potter (1998) in her development of a theoretical framework of academic support services for distance services.

Implementation Plan

The implementation plan was developed in the following stages:

- Determination of learner needs and program goals
- Determination of desired program and learner outcomes
- Performance of gap analysis between current and identified outcomes
- Determination of needed resources, such as personnel, technology, or funding
- Determination of specific activities to achieve organization-wide support and identified program outcomes
- Determination of means to monitor program progress continually after implementation

Evaluation Plan

The evaluation plan included two paper-and-pencil surveys, one to gather data from first and second year learners, and the other to gather data from those in their third year and beyond. A focus group interview guide was designed to gather data from current students and recent alumni, either by telephone or in person. The focus group interview guide was designed to be modified easily to gather data from cluster personnel, faculty, or staff.

Results

The diversity of responses from groups surveyed highlighted the importance of gathering information from the entire academic community, not just the learners. The needs, concerns and suggestions resulting from the surveys and focus groups fell into four broad categories: writing, assessment, communication, and feedback. According to faculty, learners needed to improve their writing skills, including the ability to conceptualize a problem, design the applied research project to study the problem, analyze, and report their results in a meaningful fashion. According to faculty, cluster personnel, students, and alumni, the topic of writing also included the need to engage in practicum and dissertation writing in a timely manner. According to faculty and cluster personnel, the topic of assessment included the need for early diagnosis of deficiencies in research and writing skills, or of learning disabilities, to enable program personnel to engage in early intervention and amelioration of the deficiencies. Discussed by the entire academic community, the topic of communication included opening lines of communication between cluster personnel and faculty, among faculty members, between PHE central staff and all personnel, between faculty and students, and among students themselves. The topic of feedback was discussed from learner and faculty points of view. Learners desired feedback on course papers and practicum and dissertation documents more quickly than the program's "two week rule" required. Learners also desired more and clearer feedback on practicum and dissertation documents. Faculty desired feedback from cluster personnel regarding weaknesses noted on learners' course evaluation sheets; this would aid faculty in fostering learner success.

The purpose of the model itself is to develop and promote systems to facilitate learners' progress and degree completion. To meet learner needs, the model proposes a suite of service types supplied by a variety of providers, synchronously and asynchronously.

While students are still in the coursework phase of the program, faculty and cluster personnel can provide face-to-face assistance. Even after coursework has been completed, students may make appointments to meet with cluster personnel during class time. As the Nova Southeastern University program is designed, cluster coordinators, local research associates, and faculty are able to provide synchronous assistance. Other distance education programs may not be designed to provide any face-to-face interaction whatsoever.

Not only may NSU students travel great distances to class locations, making it difficult or impossible to meet with cluster personnel once coursework is completed, other providers of academic support services, such as practicum evaluators, dissertation advisors, and other university personnel in admissions, financial aid, career services, the registrar's office, the library, and the bookstore must always interact with learners from a distance. Therefore, much information will be provided to learners in a Web-based format, so as to be available anywhere, any time. Other means of communication will also be available: email, mail, fax, telephone, listservs, telephone, e-bulletin boards, newsgroups, telephone conference, or synchronous chat rooms.

Formal and informal services and activities are proposed in this model, including:

- Assessing skills early and remediating when necessary
- Providing an orientation program
- Providing full-time cluster coordinators to engage in regular and continuous advising
- Providing on-line tutoring
- Providing various on-line mentoring and support groups for fostering a sense of community and belonging, studying for comprehensive exams, completing practicums, and completing the dissertation
- Providing full-time technology support for learners, faculty, and staff
- Providing personal counselling by credentialed professionals
- Providing professional development opportunities for learners, faculty, and staff

Discussion and Conclusions

The development of the model to meet the major academic needs of learners included:

- The need to improve research and writing skills
- The need to improve time management skills
- The need to integrate practicum completion into coursework
- The need to complete the dissertation in a timely fashion

Methods to meet those needs fell into three main categories:

- Improving learners' readiness and supporting efforts to engage in research and writing
- Improving time management skills and reducing procrastination
- Resolving other enrolment issues

Improving readiness includes assessing and remediating writing skills when needed. Distance students should receive any necessary remediation assistance, such as help with research or writing skills during the early stages of enrolment (Granger & Benke, 1995, p. 23; Potter, 1998, p. 69). Mentoring, tutoring and workshop opportunities provided to improve research skills can also be designed to encourage students to begin seeking practicum and dissertation topics early in their enrolment (Boyle & Boice, 1998, p. 92; Wilson, 2000, p. 282).

Improving readiness includes orienting learners to the expectations of the distance education program in which they are enrolled, as well as the professional role for which they are preparing (Boyle & Boice, 1998, pp. 88-89; Venkaiah, 1995, p. 154). An example is the orientation program offered by the University of Maryland, which includes a professional orientation course that introduces students to issues in their profession and helps them understand what is expected of graduate students (Taub & Komives, 1998).

Building a scholarly community to engender a feeling of loyalty and belonging, through mentoring and advising programs can improve readiness to learn (Dunn & Moody, 1995, p. 4; Johnston & McCormack, 1997, p. 258; Miller & Newman, 1996, p. 13). The steady presence of the on-site cluster coordinators is a “vital link to learner success,” with advising, tutoring, feedback and local support (Granger & Benke, 1995, p. 23), and a “continuity of concern for students” (Keegan, 1984, p. 93).

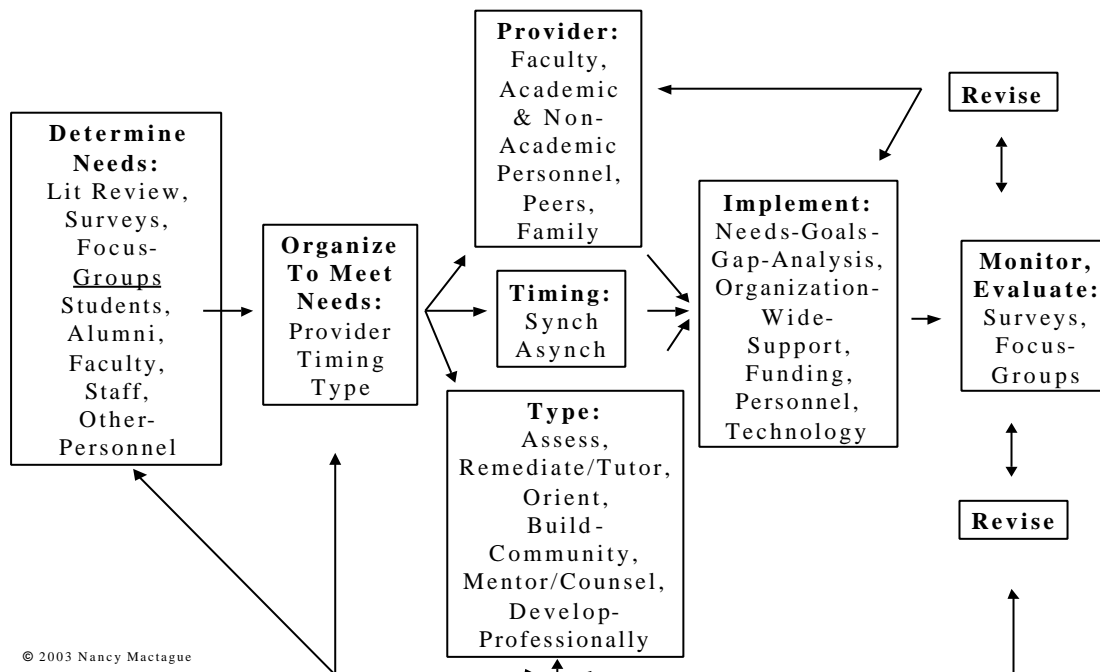
Mentoring could improve learners’ overall understanding and managing of the practicum process (Dunn & Moody, 1995, p. 4). The student participants admitted that they tend to procrastinate on completing their practicums and would like someone to prod them along. Even though the typical adult learner moves from being dependent upon the instructor to being self-directed, assuming an increasing amount of responsibility for his/her own learning and wanting to participate in planning, organizing, and implementing that learning (Knowles, Holton, & Swanson, 1998, p. 40), a watchdog to hound PHE students into setting and meeting deadlines is needed.

Mentoring programs can also lessen the isolation felt by dissertation writers (Boyle & Boice, 1998, pp. 87, 91; Venkaiah, 1995, p. 152). Virtual social interaction can form an important part of the educational experiences of postgraduate students, reducing their sense of isolation and promoting a sense of scholarly community (Lally & Barrett, 1999, p. 153).

Counseling on personal matters may be needed. Online access to self-help articles; confidential, online mental health information and referrals to assistance in the learners’ home communities may help resolve issues that are barriers to learning (LaPadula, 2003, pp. 124-125).

Other enrolment issues include promoting electronic communication between learners and faculty, forming virtual learning communities, and providing technology training. Communication with academic and non-academic personnel could be improved through virtual student newspapers, special interest chat rooms, online tutoring, or progress-toward-completion outlines (LaPadula, 2003, p. 127).

Model of Academic Learner Support Services



Application and Use of Model by Other Institutions

Other institutions may use this model as a template to improve the support provided to their own learners. While institutions may vary greatly one from the other, the basic steps in the process will remain the same: determine needs, organize to meet needs, implement, evaluate, and revise. To determine needs, this author used paper-and-pencil surveys delivered by snail mail, and telephone

conference focus groups. These methods may not be optimal for other organizations, which may prefer to use individual telephone surveys, or on-line surveys such as those available from <http://www.zoomerang.com>.

The process of getting organized to meet needs is the most complicated, as it must take into account who is providing the service, when and how the service is provided, and what specific services are to be provided to whom. NSU learners are fortunate to have face-to-face access to a cluster coordinator to whom to go for assistance. On the other hand, Central Michigan University (CMU) offers completely on-line courses with no face-to-face interaction. CMU provides a “course coordinator” for its web-based courses, a real person who is accessible via phone or email to provide assistance. Assignments, materials, grades, library services, syllabi, chat rooms and other electronic communication means are accessible from the course website (CMU Course Preview). Others who provide services may be non-academic personnel, both within and outside of the institution. The support of learners’ family members and friends is important to their success.

The timing of providing services must also be considered. Even before admission to a program, assessment of learners occurs, and may result in admission, provisional admission, or rejection. When new learners are admitted to the Doctoral program of The Union Institute, they meet face-to-face for the ten-day-long Entry Colloquium, during which time the Project Demonstrating Excellence (dissertation) topic is chosen and proposal is developed (Union Handbook, n.d., pp. 7, 8). If faculty feel that a newcomer is not equipped to meet the demands of Doctoral work, he/she will not be admitted to the program. Other programs may require essays or standardized tests as part of the application packet, use them to assess writing and other skills, and potentially require a writing or other remedial course to be successfully completed prior to formal admission to the program.

Orientation to the learner’s new role as a student should begin to take place as soon as the new learner is admitted. A mini-orientation to being a distance learning student, the first pages of the CMU web-based course include information on expectations of students, and advice to keep up with coursework each week (CMU Course Preview). At the beginning of each distance learning course, whether or not as part of a degree-granting program, the faculty member should clarify his/her expectations of students, as well as clarifying what students can expect of him/her. Building community, counselling and mentoring can take place synchronously and asynchronously. Professional development will take place for both faculty and students. The CMU Online Faculty Resource Center includes documents on best practices for teaching adult students, expectations for students, and the CEL Faculty Handbook, among others (CMU Faculty).

The first step toward implementation is performing a gap analysis to compare needs as stated in survey findings versus needs currently being met. Organization-wide support for improving or instituting a program of services must be achieved, as this support is necessary to receive funding, personnel and technology to make the program of services a success. This includes developing job descriptions and salary ranges for key personnel, a budget for professional development, and a budget for the purchase or upgrade of technology.

Finally, student progress and the effectiveness of services must be monitored and evaluated regularly and systematically. The original methods to determine needs may be adapted to an ongoing evaluation plan. The results of evaluation will be used continuously to improve the program of services offered. Continuous evaluation and revision will allow the program to respond to changing learner types and characteristics, and keep the institution’s attention focused on learners (Garland & Grace, 1993, p. 27). The research undertaken at NSU has been summarized, and a generalized model provided so that institutions may develop a customized model of learner services with their own learners’ needs in mind (Garland & Grace, 1993, p. 86).

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Author:

Dr. Nancy J. Mactague, MA, MSLIS, EdD
Aurora University, Library Director
347 S. Gladstone Ave., Aurora, IL 60506 USA
nmactag@aurora.edu

BLURRING THE BOUNDARIES? SUPPORTING STUDENTS AND STAFF WITHIN AN ONLINE LEARNING ENVIRONMENT

Susannah Quinsee, City University London

Introduction

The inclusion of online learning technologies into the higher education (HE) curriculum is frequently associated with the design and development of new models of learning. One could argue that e-learning even demands a reconfiguration of traditional methods of learning and teaching. A recent consultative e-learning strategy developed by the Higher Education Funding Council for England (HEFCE) acknowledges this:

the internet and use of new technologies are changing the total operation of HE. Learning and teaching are changing as we explore the possibilities presented by new technologies (HEFCE, 2003, p.2).

However, this transformation in pedagogic methodology does not just impact on lecturers and teachers alone, as the HEFCE e-learning strategy continues 'these technologies are also bringing about new approaches in research, libraries and resources and administration' (p.2). Online learning has 'pervasive impacts and changes in other HE functions' (HEFCE, p.2). Thus, e-learning is a transformational process that posits new challenges for staff and students, both in educational methods and support.

One of the key elements of this transformational process is flexibility. Online learning is often described as providing more responsive modes of study for learners and theories of online course design frequently refer to the ability of e-learning to accommodate diverse learning styles and forms of delivery. For example, Palloff and Pratt (2001) state that 'teaching online requires a new approach to pedagogy' (p.12). This is important, they continue, because 'the online re-creation of the face-to-face classroom can be a dismal failure' (p.12).

Teaching in the cyberspace classroom requires that we move beyond traditional models of pedagogy into new practices that are more facilitative. Teaching in cyberspace involves much more than simply taking old "tried and tested" models of pedagogy and transferring them to a different medium (Palloff and Pratt, 2001, p.20).

Constructivist educational theory, in particular, is often used as a key tenet for online course design as this form of learning argues that 'people construct their own knowledge, and are socially influenced in all thinking and learning' (LTSN, 2004).¹ One source even goes so far as to argue that 'essentially, elearning is the realization of the theoretical/conceptual components of flexible learning' (elearnspace, 2004). Yet, while such flexibility is desirable and beneficial in many ways, the challenges and changes to traditional models of support for all users of such technology can cause problems.

This paper considers a number of aspects relating to the flexibility inherent within models of online learning and the potential impact of this on support structures. City University, London, is used as a case study to provide examples of online practice which support strategies outlined here (the conference presentation will give more specific examples of models used at City). In 2003, City University introduced a campus-wide managed learning environment and established an ELearning Unit (ELU) to support the development and dissemination of online learning practice across the University. This initiative provides central support for staff and students in the use of online learning,

¹ For an informative review of how consideration of online course design is posited in transformational flexible terms see the section on 'Models of Learning' in Sarah Cornelius (2002), *Learning Online; Models and Styles*, <http://otis.scotcit.ac.uk/onlinebook/otisT103.htm>

both from a pedagogic and technical perspective. The rationale behind centralizing support for e-learning was to ensure a consistent and co-ordinated approach to developing technological learning solutions. However, introducing a campus wide online learning environment has raised significant issues surrounding student support and the 'e-readiness' of the organisation. A balance has had to be reached between ensuring that generic quality standards are maintained and a centrally-designed approach is applied across all online modules to ensure consistency and the need to offer flexibility around the needs of individual Departments and subject areas.

A number of models of online learning, from wholly distance to enhanced classroom delivery are in operation at City. These models provide evidence of the variation in modes of support and illustrate the different needs of both students and staff when using these forms of learning. The philosophy of the ELU in supporting these models is outlined as a methodology for providing strategic solutions to the challenges posed by the flexibility of this mode of delivery. What is apparent through this discussion is that to provide effective support for online learners, whether students or staff, clear and solid structures need to be put in place to assist with the creation of an online community.

However, before considering this in more detail, it is necessary to consider some of the benefits and challenges of flexible learning in terms of online learning practice. This discussion raises some of the potential issues in support learners online.

Flexibility and e-learning – benefits and problems

If e-learning is integrated into the curriculum in a thoughtful and considered fashion, it can have many potential benefits. As Palloff and Pratt (2001) caution, 'administrators, along with faculty and students, need to be educated about the realities of online teaching and the impact that good courseware can have on this process' (p.12). So what are the potential benefits and how do these impact on support strategies?

Independent/autonomous learning

Through using educational technologies students have more control over the management of their learning. Meeting the diverse learning styles of students is a key aspect inherent within flexible online learning:

Online courses have the potential to reach a large number of learners. Each learner is an individual, with his or her own motivation for studying, access to resources, and study habits and practices (Cornelius, 2002, section 2: learning styles).

E-learning theoretically allows students to access materials anywhere, anytime, thereby enabling them to pace their learning and structure the course around other activities. As Littlejohn and Higgison (2003) maintain 'e-learning is seen as offering solutions to several challenges currently facing HE [...] the move towards lifelong learning [...] and the drive to widen participation' (p.8). However, students do still require some structure in order to enable them to retain engagement with the course. The Masters in Geographic Information (MGI) at City, which is taught through wholly online delivery, provides this in the form of clear coursework deadlines and other regular 'check-in' points so that learners do not feel isolated or disorientated. This has resulted in high levels of retention. Tracking and monitoring distance learning students in particular is valuable, but a concern for staff is how to design relevant activities that students will engage with? How should we support these new forms of engagement?

Peer support

Simpson (2000) notes that 'education [...] is essentially a process of dialogue' (p.9) and the communication tools inherent within the online learning environment can assist with this by facilitating peer support. For example, conferencing and discussion tools enable learners to interact independently from tutors – often reassuring each other and enabling students to share professional issues. The Centre for Professional Development and Innovation (CPDI) at City uses discussion

boards for vocationally based courses and asks students to draw on work-related experiences to complete assignments. This can be helpful in reducing the burden of academic staff, but managing discussion boards can be time consuming and still need monitoring. How can we prepare staff and students for the kind of interaction?

Responsive learning and teaching

E-learning can be more responsive to the needs of both tutors and students, as outlined in Peters' research on learners' views of online delivery (2001). As students are engaged in a number of different forms of communication, new strategies to assist with the learning process can be utilised quickly and easily. For example, the MGI course uses chat sessions to clarify a certain topic. When e-learning is used to support face-to-face teaching then lectures may become more like seminars, with students accessing material prior to the lecture and then using the lecture time to ask questions and discuss certain issues in more depth. This technique is used in the Department of Information Science to facilitate greater student impact.

Each of these potential benefits has a negative corollary, and much of this is dependent upon the design of the online programme and the associated support provided. It is necessary to try to anticipate some of these problems in order to direct and tailor support strategies for online learners.

Isolation and disengagement

This form of learning, particularly with distance students, can result in a sense of isolation or disengagement for students. And there can be no denying that distance students are working, in theory at least, in isolation from other students. As Simpson (2000) maintains 'such isolation must inhibit if not prevent entirely any possibility of dialogue in their studies' (p.9). And as stated earlier, dialogue is at the heart of education. This clearly poses a major contradiction for educators working with online learners. Should we be trying to replicate face-to-face interaction when this is often impossible or should we be exploring new methods of generating dialogue with our learners that take account of the new environment in which we are operating? In addition, the lack of a formal structure or timetable which characterises face-to-face contact can exacerbate feelings of loneliness. Students may feel that the online course lacks structure, that there is no-one checking on their progress and that the online setting is merely a faceless environment. To counter isolation online communities have been developed for distance students at City, these will be considered later.

Increased staff workload

There is the perception, sometimes among students and management, that e-learning can take less time. However, as anyone involved with online learning will testify production of materials and adequate support of students using the online materials can take a phenomenal amount of time. Littlejohn and Higgison (2003) acknowledge the dilemma for academic staff as 'e-learning requires investment of time and effort [...] perhaps time and effort that would otherwise be spent on research' (p.6). Students may expect support through discussion boards, chat, email and face-to-face. This can place a huge, and often unanticipated, burden on academic staff. This workload is often seen as invisible, many lecturers in the UK are contracted to teach dependent upon face-to-face contact, not online teaching. The amount of discussion messages generated can cause resentment and time pressures. Skills in information management and organisation are necessary. How can staff, particularly librarians and information specialists help users develop these?

Increased expectations

Students often expect much more when materials are online unless clear criteria are established to address this. This is particularly true in relation to response times to messages or emails. McKenzie (2000) describes how students can come to online learning with particular assumptions related to email which can increase the workload for tutors (p.3). She advocates learning contracts and organising 'a road show to manage the expectations of potential candidates prior to signing up for the course' as ways of reducing the online "culture shock" (p.5). The MGI course provides pre-course

orientation to the online learning environment for prospective students so they can ascertain what it is like to study online.

The ELU at City uses service level agreements to show staff what support and guidance they can expect from the ELU team. This enables clear boundaries to be established in terms of responsibility and ensures that the students know where to go for support and guidance on using online resources.

In order to deal with these challenges of flexibility within an online environment we need to develop new forms of support in two key areas; the creation and formulation of staff roles and the very structure of the online environment itself. These strategies depend upon a more structured approach to provide students and staff with the confidence to explore these new types of learning in a more familiar fashion.

Strategies for support - Staff roles - who is working with online learners?

By re-evaluating staff roles the burden of support can be shared across academic and administrative staff. The introduction and spread of online learning has had a great impact on the roles of those supporting students, from academics to administrative staff. Figure one illustrates how traditional roles are being redefined by the e-learning environment.

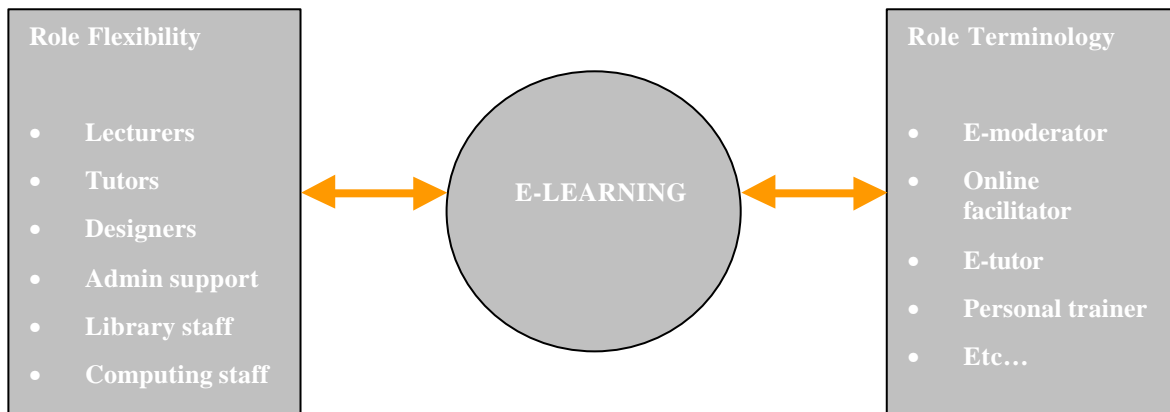


Figure one: who is working with online learners?

Gilly Salmon (2000) in her influential work, *E-Moderating*, poses a number of different titles for online educators, from 'e-moderator' to 'online manager' or even 'faceless facilitator' (pp.169-71). Her contention is that the use of new technologies for teaching and learning demands a new set of roles, or at the very least, revised terminology for those who are involved with the delivery and management of these electronic environments. Indeed, as we have seen the very flexibility offered by e-learning often results in a blurring of traditional boundaries between tutors and students. However, this greater fluidity of the learning experience may become a barrier to enhancing learning if students do not feel properly supported. Are students embracing this freedom to independently manage their own learning or can it lead to disorientation and isolation? And as academic staff, are we able to adequately respond to the new demands placed upon us by students? By looking at practical examples from City University we can provide some answers to these questions.

Change in administrative roles

To support the MGI course a new staff role was created to embrace the diverse elements of supporting online distance and face-to-face students. This role encompasses elements of traditional academic duties, for example personal tutoring and content editing. The Course Resources Manager (CRM) has responsibility for maintaining and sourcing the content within the virtual learning environment, acting as a conduit between students and academic staff and denoting the first point of call for problems relating to the course. This hybrid role reflects a new model of student support and contact with academic staff. The title 'Course Resource Manager' was also a deliberate choice in that it avoided conflation of the role with just online duties and illustrated the wider remit of the post. In order to

respond to the pressures that academic staff face in terms of time management with creating new online resources for the MGI course, the CRM works to share the burden by monitoring discussion boards, checking and tracking student progress and assuming some of the pastoral care duties traditionally assumed by lecturers. The CRM also represents students' interests to other University services, such as the library and computer services, in order to present a coherent and consistent approach and ease access to diverse resources for distance students. Retention on the course was above 85% for over three years, which compared very favourably with other distance learning courses.²

By creating this role, staff on the MGI course were able to address some of the new challenges presented by the introduction of online learning. The role blurred the traditional boundary between academic and administrative staff and meant that a team-approach was taken to course delivery and management. This enabled some of the potential problems with the use of e-learning to be avoided.

Lecturer hold back

As we have seen online learning environments can provide increasing flexibility for lecturing staff who can respond to discussion postings anywhere and anytime. This can assist with the dissemination of information too as rather than answering questions on an individual face-to-face basis discussion postings are available for all to see, hence helping prevent repetition of information. However, if staff respond too rapidly to postings then unrealistic student expectations may be created and this may cause less peer support.

In a module for online tutors run by the Centre for Continuing Professional Development and Innovation (CPDI) at City, students' postings to the discussion board are assessed. The lecturer sets out clearly the requirements for the students and part of the assessment is how they respond to each other on the discussion board. This exercise substantially increased postings to the discussion (by over 50%) and encouraged peer support as students engaged and supported each other online.

Learning to holdback from the discussion board is vital for student, and lecturer, support. This is model is supported by Palloff and Pratt's advice to ensure that 'balance is the key to successful participation (2001, p.36.)

Educational development and training

Staff and students need professional development, training and preparation to cope with online learning (see also Palloff and Pratt (2001), p.15). Staff, in particular, need educational development in the following areas: CMC (computer mediated conferencing) and online discussion tools; production of materials; management of online information; tracking and assessment issues.

The ELU at City ensures that no member of staff can use the online learning environment unless they have undertaken a staff development programme covering basic principles of online learning and course design. ELU staff also provide all students with a generic induction on the use of the managed learning environment; this is supported by academic staff who illustrate to students how online learning will be used in their specific programme of study and why. Students and staff can use the ELU helpdesk for technologically related queries and staff can receive individual advice and consultancies. ELU staff are enrolled as auditors on all online modules, primarily to act as mentors to staff new to online learning and provide ongoing support and guidance. This auditing role also fulfils quality assurance requirements. New e-learning programmes or modules must be signed off by the ELU as part of the validation process.

² Simpson (2000) cites that on some distance learning courses dropout rates can be as high as 58% (p.80).

Strategies for support - Structuring the online environment

Learning materials structure

Using familiar terms, such as referring to course material as 'lectures' and asking students to engage in practical exercises, can assist students orientate themselves to the online environment and understand what is expected of them. Not all elements of the course should be re-branded to illustrate the 'e' element as Gilly Salmon suggests with her ideas for renaming 'e-tutors' (2000, pp.169-171). The MGI course is structured around weekly 'sessions' to provide continuity and structure. Each module shares a similar navigational structure and design. Online support for modules delivered in the Department of Information Science is indicated by a grading system which denotes what students can expect from that particular type of module. This system has increased student satisfaction with the online environment and assisted with managing expectations. The model is likely to be rolled out across the University so that students understand what tools are available online.

The needs of the students combined with the requirements of the course should be carefully balanced. Making the design of the environment consistent and clearly structured can assist with student usage.

Creating online communities

The Department of Information Science uses the online learning environment to generate a sense of community by creating open spaces that all students have access to. A Resource Centre has been developed where students can share general information on issues relating to their different programme routes, engage in induction activities, discuss professional opportunities and receive information on Departmental policies and practice. The Resource Centre includes a social area where students can participate in more informal interaction. This means that the discussion areas for the teaching modules are retained solely for pedagogic discussion but still gives the students the opportunity to develop an informal network elsewhere within the online learning environment. In addition, each degree programme has an online space where students can discuss issues specific to that programme or engage in informal chat. Chat rooms are also either designated social or learning related areas. These structures provide a good foundation for the development of an online community, as well as assisting with the management and flow of information.

Conclusion

In conclusion, then, in order to benefit from the flexibility inherent within the use of online education technologies for both staff and students, clear guidance and strategies are needed. Structuring the online environment and course material clearly can assist with orientation of users, ensure student engagement with the course and assist with the management of information. Channelling and organising the increase in communication and information which is generated through online learning is facilitated by transparent structures and support mechanisms. By reconsidering the roles of those working with online learners, new modes of support can be developed which are responsive to changing needs of all participants within the online environment. In order to benefit from and capitalise on the flexibility for teaching and learning encapsulated within online learning environments, attention needs to be made to creating comprehensive, organisational support strategies.

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Author

Dr Susannah Quinsee
Head of ELearning/Associate Director of Library Information Services
City University,
Northampton Square
London
EC1V 0HB
s.quinsee@city.ac.uk

STUDENT RETENTION ISSUES IN THE ONLINE MASTER OF DISTANCE EDUCATION (MDE) - AN EVIDENCE-BASED APPROACH

Ulrich Bernath, Carl von Ossietzky University of Oldenburg & Eugene Rubin, University of Maryland University College

Introduction

Against the background of existing research on student retention (Tinto 1993) it is commonly stated that retention in open and distance learning (ODL) contexts is poorer than in conventional higher education. Woodley & Parlett (1983), Peters (1992), Kember et al. (1992), Moore & Kearsley (1996), Muilenburg & Berge (2001), and Gibbs (2003) contribute to and reflect on these research findings.

Comparisons on retention issues in conventional higher education and ODL contexts often are descriptive and remain on the surface. They do not carefully take into regard that students in open and distance learning are quite different from students in conventional contexts and that institutional settings in most cases are quite different as well. A few of these differences are: (i) Conventional institutions in higher education require formal entrance qualifications, whereas institutions in ODL allow for open access and do not select their students based on formal entrance requirements; (ii) Most institutions in conventional higher education provide three- to four-year campus-based programs for full-time students. ODL institutions offer a greater variety of programs to students who are primarily working adults and study part-time; (iii) Students in conventional higher education settings combine their courses of study with interests in campus-based social life experiences, whereas students in ODL usually study on top of work and family commitments.

Hence, the social dimension of learning must be re-considered in the structurally different contexts of ODL. An important contribution to better understand the affects of external constraints and interfering variables on student retention is Gibbs' recent summary on "the content and outcomes of a symposium entitled 'Student retention in Open and distance learning' held in Cambridge, England in May 2003". Inspired by this the authors reflect on the online Master of Distance Education (MDE) program to exemplify the relevance of a deeper analysis into retention issues of adult learners in open and distance education contexts in general and in the MDE in particular. The findings, indications and new hypotheses as a result of this case study ask for an extended and new approach preferably derived from biographical data. The relevance of such a wider and more differentiated approach is seen as crucial from a program administrator's point of view and covers a wide range of concerns including students' satisfaction as well as cost recovery issues. Ultimately, this precise insight into student retention will allow for appropriate institutional interventions to improve program quality in general and students' retention in particular.

A brief description of the MDE

The MDE was launched in January 2000 by the degree granting University of Maryland University College (UMUC) in partnership with Carl von Ossietzky University of Oldenburg. The program is completely accessible online. It is designed for adult learners who are or intend to be involved in distance education within the educational, business, government, and not-for-profit sectors. Graduates of the MDE are prepared to engage in the planning, design, implementation, delivery, and support of distance education and distance training programs. In consequence, the MDE takes a more multidisciplinary approach by seeking an appropriate balance between the pedagogical, technological, and economic aspects of distance education, and the broader theoretical, historical, and social views of this field (Bernath & Rubin 2003).

Having offered its first course in Spring 2000, the MDE has grown to a global student body representing 38 different states and 12 nations within its first three years. A total of approximately

1,800 course enrollments in 97 sections of a total of 18 courses occurred between Spring 2000 and Summer 2003. As of Summer 2003, 27 Master degrees and 114 fully integrated graduate certificates in distance education to a total of 70 students were awarded. The students come from very diverse backgrounds. Almost all work full time. Their present employment includes higher education, corporations (often in a training capacity), government and non-profit organizations (again, often in a training capacity), and military, with a small minority from the K-12 education sector.

Data about MDE students are available from UMUC's information-management system ADAM, from standardized course evaluations and additional program-specific evaluations that have been administered from the beginning of the program in Spring 2000 by the partnering institutions. Some of the related data and interpretations have been published (Bernath & Rubin 2003, pp. 32-40).

Approaching retention issues in the MDE

Retention has not yet been a major issue for the program directors as the program has only recently matured towards the graduation of its first students. What has been in the fore were analyses on the goals of program beginners with respect to courses and scheduling, course evaluations with respect to student satisfaction, and studies particularly geared to reflect on the quality of the interaction between the faculty and their students as well as between the students themselves in the online classes which are in most cases designed as virtual seminars (cf. Bernath & Rubin 2003, pp. 10-19). Furthermore an exemplary cost analysis of the development and presentation of courses has been conducted by Hülsmann (2003).

The online MDE provides a rather unique context for studying at a distance. A total of about 640 students have entered this program between January 2000 and Summer 2003. In the following Fall 2003 semester only 187 of these beginners re-enrolled in other MDE-program courses. During this time 27 graduates have successfully finished their studies. The question of interest is now: What has happened to the students who began between Spring 2000 and Summer 2003 and did not appear in Fall 2003 as course takers. We'll break down the numbers by identifying groups of students as follows:

640 students joined the MDE between Spring 2000 and Summer 2003 only 187 students enrolled in Fall 2003
453 missing students in Fall 2003
Consider the potential for dropping out after successful completion of course, certificate, or program: <ul style="list-style-type: none"> - 27 graduates; - a portion of 70 students who earned a certificate and achieved their goal; - a portion of 50 students who entered the program through a course other than the beginner's course and achieved their goal by choosing this one course; - a portion of 140 students who successfully finished the beginner's course and did not re-enroll in any other course of the MDE program (which comprises beginners who claim that they do not aim at a certificate or a degree and may have achieved their goal by taking just one - the beginner's - course).
Consider the potential for dropping out after failing to achieve a goal in a course or the program: <ul style="list-style-type: none"> - 78 students who withdrew from the beginner's course within the first four weeks; - a portion of 13 "dissatisfied" students in the beginner's course; - a portion of 127 students who withdraw from other courses than the beginner's course; - a portion of 76 cases where students were "dissatisfied" in other courses than the beginner's course.
approx. 100 remaining students who take a break or either belong to the group of satisfied or dissatisfied students and dropped out for other reasons good or bad...

We will try to find answers and hypotheses for deeper insight into the retention issues of the MDE program. Along with these hypotheses and answers, the limitations and possibilities for institutional interventions to control student retention will become clearer.

There is sound evidence that the adult students in the online Master of Distance Education program are extremely heterogeneous with respect to their educational goals and ways to achieve them. A standardized drop-out questionnaire would most likely fail to deal with the diversity of these aspects.

We therefore decided to approach this complex issue step by step by seeking possible explanations based on evidence from evaluations and available student data as well as from our observations as program directors and teachers in the program..

Analyzing registration and enrollment numbers

Students interested in the MDE are strongly recommended to start with the beginners' course *Foundations of Distance Education (OMDE 601)*. Data show that more than 90 % (N=590) of all new participants actually take this course.

Approximately 50 students between Spring 2000 and Summer 2003 entered the program and did not take the beginners' course. About 50 % of these were students from other universities who picked one course in the MDE program and transferred these credits into their original programs. The other 50 % are not as well known to us. It is not clear if these students were interested in only one course, in a set of courses, or even in a certificate or the whole MDE program. These students have not been tracked so far. According to McGivney (1996) there is a high risk when making a wrong course choice at the start. With this in mind we estimate that the following analysis may be influenced by approximately 25 students, who belong to this group but cannot be distinguished from the group of students who started with the beginner's course and who will now be analyzed.

The total number of students who enrolled in the beginners' course, OMDE 601, since the program started in Spring 2000 through Summer 2003 is 590. As mentioned above only 187 students became active course takers in Fall 2003. Obviously, 403 (590-187) students did not re-enroll in Fall 2003. The total number of missing students is even higher (428) when the 25 above mentioned students who entered the program through another than the beginner's course are added. On the other hand, 27 of these 428 students are Masters graduates who finished their studies until Summer 2003. This leaves us now with 401 (428-27) students unaccounted.

Withdrawals before the course started

Student statistics show that a total of 78 students withdrew in the first weeks of the 15-week long *Foundations of Distance Education* courses and must clearly be regarded as drop outs. Of these 78, some never entered the virtual classroom, others entered the class but never contributed a posting and a few were active during the first weeks of the course until they withdrew in the fourth scheduled week at the latest (based on the refund schedule for course withdrawals).

In a few cases students explained their decision to withdraw from the *Foundations of Distance Education* course with personal and mostly family or job related reasons. Typical statements of this kind are: "*I am not planning to continue in the program, and am taking steps to withdraw from it due to added time pressures from my job. Thanks so much for a fine course, or at least the portion of it that I experienced.*" or "*Dear Faculty and Fellow Group Members, Due to extenuating circumstances, I have not been able to keep up with the course load and thus, I have, today, officially withdrawn from the given course. ...*".

The numbers of so-called non starters are small: A total of 78 from Spring 2000 through Summer 2003 is an average of 11 cases in each semester. It would be of particular interest to learn what kind of institutional interventions would be necessary beyond the supporting services already provided such as *Getting Started in the MDE*, a preparatory package accessible online prior to registration. Gibbs (2003, p. 46) states that "the greatest component of drop-out in many ODL systems happens before students have engaged in their course: they register and then don't really start." One of the reasons is the fact that access to ODL programs is open and has a low financial risk. This statement can be applied to the MDE, however the 13.2 % (78/590) of early "withdrawals" in the MDE do not represent "the greatest component" when compared to all "missing" students. In order to see how big the component of all drop outs in the MDE context really is, we must continue to track the other 323 (401 – 78) still "missing" but not yet identified students.

Not re-enrolling after the successful completion of the first course

We learn from UMUC's student information system that 37 % of all students don't take other courses after the *Foundations of Distance Education* course. 37 % of 590 are 218 students. This number includes the 78 withdrawals. The remaining number of students is 140 (218-78) representing those who successfully finished the *Foundations of Distance Education* course but do not re-enroll in any other courses of the MDE program. How can this drop-out phenomenon after the first course be explained? Analyzing available data from questionnaires and standard evaluation as well as observations in classes may help to find the answers or appropriate hypotheses with respect to this particular group of students.

Data drawn from a MDE questionnaire

Immediately after the start of the *Foundations of Distance Education* course students receive a questionnaire and are asked to express their initial intentions and plans in the MDE program (*Do you plan to participate in the MDE program towards graduation with a Masters degree?*). The results of all questionnaires show that about two thirds of all beginners in the MDE program aim at a Master's degree, close to 20 % aim at a certificate, and between 10 and 15 % are undecided. The same questionnaire is administered at the end of the course in order to see if the experiences of their first course cause any change in their plans. The comparison of results in all semesters shows that there is little change with respect to the overall goals towards formal qualification, however there is a significant change in the time frame to reach the goals. There is a shift from two and three years to a four year plan for graduation. This change may also have some impact on the mild shift from pursuing a MDE degree to aiming for a certificate (Bernath & Rubin 2003, p. 29) and it may result in the one or other early drop out.

Clearly the 10 to 15 % (N=88) of undecided students represent a potential for dropping out after the first course. The reasons for dropping out may range between a negative "test" experience to being satisfied with this one-time experience.

Assumptions based on the standardized course evaluation results

UMUC administers a rigorous standardized course evaluation at the end of all of their courses. The weighted average mean of all 50 MDE course sections taught from Spring 2000 through Summer 2002 with a total of 1,123 participating students was 3.92 on a five-point-Likert scale. The (mandatory) evaluation takes place about three to four weeks before the end of the 15-week-long courses. It has been stated (Bernath & Rubin 2003, p. 37) that the *Foundations of Distance Education* course, with a range of ratings between 4.02 and 4.55 and its weighted average mean of 4.17, offers - for most beginners - a highly satisfactory course experience. Only a small percentage of about 3 % (N=13) of all beginners "strongly disagree" with the notion that their personal goals were met by the course. The overall percentage of dissatisfied students in all MDE courses is 4.8 % (N=76). In these cases one can assume that dissatisfaction may lead to dropping out from the program.

The initial question raised in this section was: Why do 140 students not re-enroll in other MDE courses after having successfully finished the *Foundations of Distance Education* course? We identified quite a high number of "undecided" (N=88) and a small number of dissatisfied (N=13) beginners and assume that a reasonable portion dropped out. With this in mind the relatively high number of more than 12 students in each semester who completed the beginners course successfully but don't continue, shrinks to about 5 - 8 for whom it is not obvious why they don't re-enroll. A wide range of intervening factors for dropping out can be taken into regard (cf.. Bernath & Rubin 2003, p. 35). Open-ended questions in the standardized course evaluation as well as in an additional questionnaire that seeks to identify those course elements that contributed most to a successful learning experience offer room for mentioning critical aspects of the course. Some of these critical remarks refer to other than content-related aspects like time constraints, workload and financial problems, which can not easily be addressed by an institution with a strict semester-course regime, academic policies, and fixed fees.

The question of appropriate interventions does not seem relevant for those students who enter the program and plan to take just one course. It is, of course, extremely relevant in cases where students express dissatisfaction with their first course experience.

It seems that the variety of potential reasons for the 140 students to drop out after the first course leaves only very few students in each semester who have common reasons for their dropping out. It may be more likely that each student denotes a rather unique set of reasons for dropping out, which corresponds very much with the explanations for the success of their peers on the other side of the medal. We have previously shown in detail how each individual student constructs his or her own learning process and how much these students differed in their value judgement about the elements that constitute the teaching and learning process in the online learning context of the MDE (Bernath & Rubin 2003, p. 40).

Drop out of advanced students in the MDE

Some evidence for explaining the drop out of about 140, and prior to this of about 78 students, has been identified. Still, there are 283 students (401-78-140) who did not appear as active students in Fall 2003 after finishing successfully and satisfactorily the first course between Spring 2000 and Summer 2003. We regard these students who finished the beginner's course successfully as 'advanced' students.

Certificate completers

Results from the above mentioned *MDE Questionnaire* show that close to 20 % of all beginners only aim at a certificate. In taking this for granted we can statistically identify about 102 students (20 % of the 512) who successfully finished the beginner's course and may have reached their level of aspiration by earning a certificate. Statistics show that as of summer 2003 114 certificates were awarded to 70 students. Some of them may aim at a certificate and at graduation, which makes it difficult to estimate the portion of 70 students who have completed their program goals and left the program successfully. Let us assume it is just one half (N=35). In this case the remaining number of missing students would now be 248 (283 - 35).

Withdrawals from other courses than the beginner's course

The analysis of course enrollment and withdrawals in all courses of the MDE program shows that there is a total of 127 students who withdrew from one of the six core courses that follow the *Foundations* course. In some cases the rates are remarkably higher than in the beginners' course. Reasons for this phenomenon are manifold and not yet clear. The voice of an advanced student in one of these core courses may indicate unexpected directions for the analysis of circumstances that result in such relatively high numbers: *I wanted to check in with you and [name] to let you know that I just withdrew from all of my OMDE classes this semester. I wanted to thank you both for the information and resources you have given me, and let you know that I really enjoyed the class up until the time I had to withdraw. The reason I withdrew had nothing to do with the class; I just changed jobs and need to focus my efforts on that for a while. I hope to re-enroll in your class in a future semester when I have settled in at work. I had to withdraw so quickly because of the refund policy and I did not have a chance to say "goodbye" to the class. I had wanted to post a note in the cafe. If appropriate, would you post one for me? Good luck with the rest of the semester and I hope to "see" you both again soon.*

With respect to the course evaluation results it was already stated that there are about 4.8 % dissatisfied students (N=76) and it can be assumed that they represent another distinct group of potential drop outs.

If we take both groups - the 127 "withdrawals" (those who dropped out before the course ended) and the 76 "dissatisfied" (those who may drop out after their critical course experience) into account and assume that again just one half drops out from the program we may so have lost another 101 (50 % of 127+76= 203) students and remain at least with 147 (248-101) still missing students.

We know from observation that withdrawals and dissatisfaction does not automatically result in dropping out from the program and therefore had some good reason for the assumption that only 50 %

of these two identified groups may have dropped out. For the remaining 147 missing students other reasons must be found to complete the picture.

Not re-enrolling after successful completion of more than one course

The UMUC information system has indicated that a number of students stop taking courses after they complete two, three or even more courses. We estimate that approximately 60 student left the program after taking two courses, 40 students left after taking three courses, and another 20 students left after taking four or more courses (for reasons other than successfully completing a certificate). Thus, the unaccounted students are probably reduced to 27 (147-120). Reasons for these drop outs or stop outs may be similar to those that drop or stop out after just completing one course. These reasons are varied and may also lead to external factors like the economic recession Interestingly, the comparison of the enrollment data showed a significant slump in enrollment numbers in Fall 2002 and Spring 2003. Asking for possible reasons, the war in Iraq came into concern, which affected a number of MDE students in the U.S. military services who were not able to continue their studies. Such temporary interruptions and unforeseen circumstances as well as other home and work life contexts are, of course, beyond the institution's capacity for interventions.

There is also evidence that some of the students who successfully completed the first course in any semester including the Summer term 2003 and who did not re-enroll in Fall 2003 will come back later. Family and work responsibilities may require a pause. The structure of the MDE program allows a break and this phenomenon can be phrased as stop out rather than drop out. The reasons for advanced students to withdraw from a course or stop or drop out of the program are manifold.

Concluding remarks on student retention in the MDE

The micro analysis of student retention in the MDE program shows that large numbers break into smaller ones at different stages of a course of studies. We found that the total of about 40 drop outs in each semester may relate in average to about:

- 2 beginners who never entered the classroom and withdrew from the course;
- 2 beginners who never contributed with a posting to their class and withdrew;
- 3 beginners who became visibly active but withdrew as long as fees are refunded;
- 1 student who may give up after dissatisfaction with the beginner's course;
- 10 students who successfully completed the first course and don't continue in the program;
- 2 advanced students who may give up after dissatisfaction with an advanced course;
- 10 advanced students who withdraw from another than the beginner's course;
- 7 students who may give up for private, work-related and other reasons;
- 3 students drop out after successfully completing a certificate program and thus have reached their personal goal.

It seems helpful to look into these details in order to learn and understand that institutional interventions for improving student retention are limited. We can conclude that there are likely less rather than more situations regarding student's circumstances that can be controlled by the institution, and more importantly, that the number of different cases of each circumstance can shrink to small portions. This makes it difficult to invest in institutional provisions for improving students' retention especially in stand-alone programs of the exemplary size of the MDE. The case may be different, when the program is only a small unit within an institution like UMUC with its fully developed student support service or for much larger programs that might have less personal interaction with the students.

In the end we learned that we needed 590+ enrollments to produce approximately 180 active students. We may possibly influence 20, or perhaps more, by a variety of interventions to re-enroll rather than to stop out for a while or drop out for ever. The expected MDE program completion ratio will be around 30 - 35% at best. If the number of students that can be influenced by institutional interventions is as small as we suspect, then we will be lucky to raise that by 3%. We therefore anticipate that the

cost/benefit of large institutional interventions may not be as great as many predict because of the small numbers that relate to each circumstance. Further research is clearly needed to better assess student's reasons for drop-out and to guide interventional decisions.

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Authors:

Dr. Ulrich Bernath, Adjunct Professor (UMUC)
Carl von Ossietzky University of Oldenburg
Center for Distance Education
D - 26111 Oldenburg/Germany
ulrich.bernath@uni-oldenburg.de

Eugen Rubin, Ph.D., Chair Master of Distance Education and Professor
University of Maryland University College (UMUC)
3501 University Blvd. East
Adelphi, MD 20783/USA
erubin@umuc.edu

IMPACT OF ORGANISATIONAL ASPECTS ON DROP-OUT IN E-LEARNING AND DISTANCE EDUCATION - REPORT OF EXPERIENCES

Helmut Fritsch, FernUniversität in Hagen

1. Drop-out

The topic I have to deal with is the influence of organisational aspects on drop-out in e-learning and in distance education. The assumption is, that there will be a similar didactic development in e-learning, if e-learning will play a role in the educational system comparable to the role institutions of distance education have played. According to our understanding mass distribution of teaching is not the organisational- didactical structure for distance education per se. More and more institutions seem to forget about the didactical structure of distance education in propagating the replicability of teaching in the hope that learning happens to a larger group of witnesses.

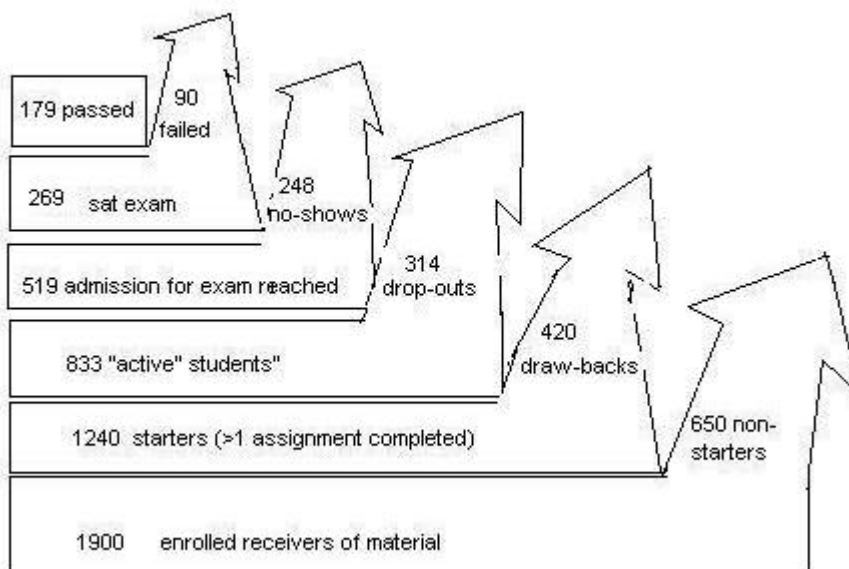
So even the FernUniversität one of the classical DE institutions - is proud of a prep-conference for course exams where hundreds of witnesses learned about the difficulties of some students with some topics in preparing for the course exam. (press release of FernUni, September 2003) As it was in classical distance education it is also in e-learning scenarios: we can trust that the topic of multiplication, of "making education cheaper", will show up with constant periodicity.

In 1988 we studied at FernUniversität the learning biographies of students in a compulsory regular course (mathematics for economists). The figures read like this:

Non-starters : of the 1900 enrolled students 650 stopped reacting after they received the material.
Draw-backs: of the 1240 "starters" (at least one assignment turned in) 420 stopped after that
drop-outs: of the 833 "active students" (more assignments) 314 dropped out or failed
no-shows : of the 519 "admitted students" (all prerequisites to sit the exam) 248 did not show up
failures : of the 269 students sitting the exam 90 failed and 179 passed

(figures reported have been inconsistent since 1988: due to some missing values)

drop out from a basics course "mathematics for economists" in FernUniversität in 1988



As a matter of fact, we can see already by the grouping of the cohort that organisational aspects do have an effect on the definition of drop-out. We grouped the students according to whether they turned in assignments, whether they kept turning in assignments, whether they reached a number of assignments necessary to be accepted to sit the written exam and whether they showed up actually sitting the exam. So the main organisational aspects to define the groups was "turning in assignments" and "sitting the exam".

1.1 Drop out in general

There have been many studies on drop-out behaviour (Kraft-Dittmar, Fritsch & Schuemer, 1997) most of which come to results like "that the invested time and the individual workload could not match the necessary input for course retention". Categories for drop-out definition rely on models of Tinto (1975) and Bajtlsmi (1988). There are discussions on factors (Brown, 1996) categorized as internal vs. external; but I propose to just look at the organisational setup of any course: Probably the phenomenon turns out to be less on the side of the student "dropping out" than on the side of the organisation, not finding enough students to comply with their predefined and often rigorous organisational structure.

Success-rates of 10 to 15% of the originally enrolled cohort are not very seldom in the difficult courses of FernUniversität: the course curriculum is not different from most normal university course curricula. Prerequisite knowledge is explicitly stated but not tested, not even in a short self-test. And then there are fixed dates when assignments are due, help is offered but does it come at the right time? So it seems that the invitation to learn most of the times reaches a wider public than the target group the course was designed for. We then should answer the question whether it is a phenomenon of drop-out or "throw-out". In distance education we know of different hurdles that have to be overcome before students may start to study- it may start with unprecise information packages, go on with non-reactivity of the institution towards enquiries and end up in formal enrolling but not caring for the individual student and by that letting them drop out. We are, at the FernUniversität, where I work, not so much different from other institutions of higher education: applicants first have to pass the test of filling in all the forms that are necessary to enrol and pay their fees.

So when we see in another course of the FernUniversität (Sonderpädagogik) a success rate of 85% over several years we must look for explanations. The course now under consideration was a course in special education for teachers working already in schools for the handicapped but not yet having had a special training for their job. The curriculum was specialized but esteemed similar to the one in normal universities for on-campus-students being trained in special education.

The description of this enrolled group gives the hints for most differences in comparing them with normal students. This course was meant for training on the job. The course design does not differ much from all the other courses but the cohort was homogenous: all had been school teachers (they knew how to learn) , all had been in-service, regionally put together into regional study groups (many of them knew each other: either they came from the same school or neighbouring schools), so there was a certain infrastructure among them, and, I think the most important feature is that their work was not aside from their study, what they learned today could be practised tomorrow, evaluated by practice and colleagues, and what they undertook was officially recognized by the authorities in that they received a reduction of workload to a certain amount.

1.2. Prevent drop out

All these characteristics seem to have favoured the results. So if distance education or in future the so called e-learning meets the following structures in recruiting students, drop-out seems to become a phenomenon of history:

- students should be used to systematic learning
- in a course there should be a homogenous student body
- there should be at least the offer of regionally organised seminars
- there must be regular assessment

- the curriculum should be job related as close as possible
- acceptance by the employer is favourable

If these characteristics are given, you can expect a high ratio of success. (<http://www.fernuni-hagen.de/ZIFF/contrast.htm>)

Being engaged in a Socrates project (<http://www.fernuni-hagen.de/ZIFF/sssel.htm>) about student support services I have been asked to enrich the meeting of tutors in an interstate project of continuing education for teachers of economics (<http://www.oekonomische-bildung-online.de/>).

There I talked about the role of tutors as facilitators and about the definition of drop out. Before my presentation I had the privilege to learn about the project and its different organisational aspects in each of the states where it is offered. So when I learned about the target group I became curious whether the success rates in this project could be prognosed according to an organisationally similar project at the FernUniversität.

I offered an online questionnaire designed according to categories for description of the scope of student support services in e-learning. (<http://www.fernuni-hagen.de/ZIFF/frgbtutor.htm>)

From the presentations during the tutor-seminar I found that there are major differences how the project (with all in all more than 70 course units and some 360 participating teachers) seems to be accepted by the respective state where it is offered:

In most states students (i.e. teachers in continuing education) can participate only after a screening process done by the ministry of education or its subsidiary institutions, after application and with the possibility to downsize the teaching workload between nil and 4 hours weekly. In all cases the program is offered in a kind of dual mode process: it is distance education or e-learning with up to 14 days on site for face to face learning. Especially in the small states monthly or even bi-weekly meetings are offered or organized by the students themselves.

The use of a certificate for the future is not clear in all cases: some ministries cannot afford to promise that the subject "economics" will make it into the school system of that state, others know that they desperately need these teachers soon.

So given the experiences with drop-out as stated above I tried to find out which of the didactical elements of this project seem to be important to the tutors and with which elements they are content.

Certainly the construction of the questionnaire representing the categories of student support services can be criticized - and indeed was in the group meeting - but the results are by no means trivial. First let's have a look at the questionnaire. (<http://www.fernuni-hagen.de/ZIFF/frgbtutor.htm>)

(The questionnaire is in German.) The philosophy of presenting to the tutors one item and expecting two categories of answers (importance and satisfaction) tried to make clear what connections we are interested in. Sometimes, when filling in a questionnaire students don't know what the goal of the question is, what will be done with the data, how these data are going to be processed: indeed, many research questionnaires go deep into hypotheses and the evaluation shows new relations between variables. There is a direct interest from our side only in the differences of how *important* something is to them and how *satisfied* they are with this aspect already. The aspect of importance certainly can be answered by everyone, the aspect of satisfaction only by those, who do have experience. Goal is to discuss a construct of "need for action".

One of the aspects of continuing education for in service training of teachers becomes clear in the answering behaviour of the tutors: These tutors are also teachers in the public school system and suffer from lack of time. Only half of the target group to which the URL of the questionnaire had been mailed, answered (N=20)- but for such questionnaires the return rate is good enough, because it is not the representativity of results we are interested in but the tendencies of this expert group in e-learning in this special project.

2. Categories for inspection

We took the categories from a grid, presented as the list of major aspects of student support in e-learning. One aspect of e-learning is very different from distance education: techniques of working with the computer in a strange surrounding of a new platform: you have to practise and get used to new behaviour according to the rules of the platform. In this case the platform was Lotus Learning Space introduced by the ZEF in Oldenburg, and from most groups of the 10 states where the project is offered, we could hear that the technical support to work with this platform has been excellent. This is indeed worth mentioning because many e-learning projects, using platforms seem to have difficulties in adopting behaviour of the students to the needs of the system. It is remarkable that on the contrary the platform used here, Lotus Learning Space, has been said to adopt its behaviour to the needs of the students.

2.1 The questionnaire: Judgement of Tutor-Tasks

The following items are to be judged according to two dimensions: the judgement of importance in general and of satisfaction according to experience; both dimensions have been offered with three answer possibilities; (-,0,+) so in calculating we took the range from -1 to +1. In the following interpretation some of the results will be marked as being quite interesting. The evaluation will take a look at the mean values of each item: small difference between these values indicate the less problematic issues - importance and satisfaction close together. Whenever there are larger differences of the sort importance higher and satisfaction low (with more than 0.50 deviance of the mean values), we may think of an issue of necessary action.

2.1.1. Introductory phase

0,74	the project has a clear-cut " identity "	0,39
<i>The "identity of the project" is valued as quite important but tutors differ only a little bit into the direction that they are not equally satisfied with it: should there be done something?</i>		
0,79	modules are interrelated modules	0,21
<i>The interrelatedness of the modules is an issue where the tutors apparently do see necessary action</i>		
0,76	students know precisely what is going to happen preview	0,12
<i>also concerning a kind of "preview" about what is going to happen throughout the project should be paid attention to</i>		
0,84	all people involved know exactly their roles	0,26
<i>with the implication of their roles some uncertainty prevails.</i>		
0,95	There are clear structures for support	0,89
<i>The clear structures for student support, though, is an example for an unproblematic issue: importance high and satisfaction high, this is one of the best results: deviation in satisfaction from importance is minimal.</i>		
0,89	individual technical prerequisites are known	0,32
<i>Individual technical prerequisites for the students is an issue, where necessary action needs to be taken -</i>		
0,11	there are lists of necessary prior knowledge	0,00
<i>it is strange, that tutors neither find it very important to have such a list, nor do they seem to be very content with the situation</i>		
0,74	there is support for weaker students not used to learning	0,06
<i>Apparently help for weaker students, who are not used to learn also is an important issue: Remembering that "students" in this project are teachers, no wonder that this aspect, quite important for normal distance education and e-learning scenarios, is not so heavily at stake- but also here we note quite a difference between importance and satisfaction!</i>		

-0,44	provide drill programs with automatic correction	-0,31
0,26	state clear assessments	0,19
0,89	motivate the passive participants	0,00

Three more comments on the didactic part: There is a clear negative vote on the inclusion of drill programs and a neutral one on assessments and a clear positive one on the task to motivate students, in this aspect some action really seems to be necessary.

2.1.3. Own Situation

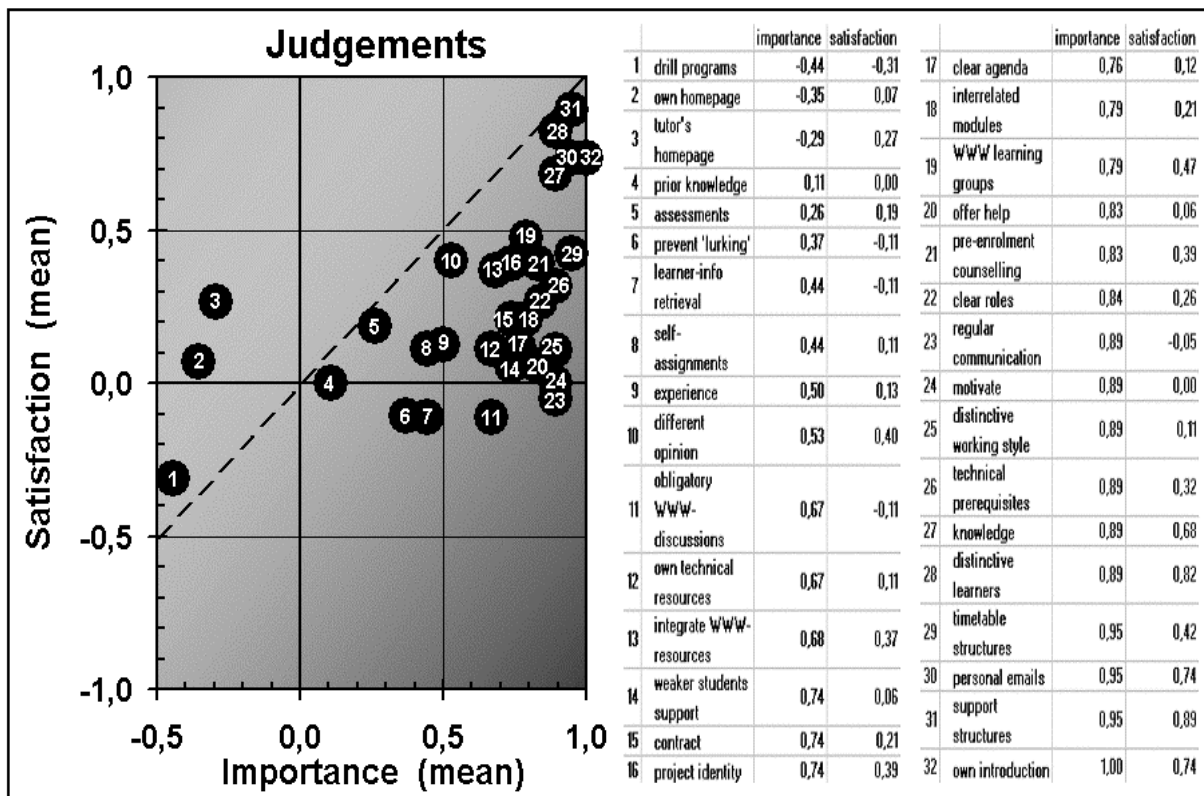
1,00	my own introduction into the project	0,74
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I should not be omitted to mention that the own introduction into the project has been almost perfect: In this aspect, rated as being very important, the participants voted at a very high rate that they are satisfied with their experience. Congratulations to the project management team!

2.1.4. personal data - gender and year of birth as well as the ZIP code of the tutors address had been included. All results with percentages and mean values included can be looked at: <http://www.fernuni-hagen.de/ZIFF/frgbtutor-prozente.htm>

3. Judgements of importance and satisfaction

There are some aspects of this questionnaire which have to be commented upon: it is clear that in questionnaires to measure satisfaction, where people are asked to evaluate, there is a tendency towards the positive view - as being the own perception of what interviewees think the researchers want to hear. This leads to a distortion of the results which can be said is systematic: in the graphical display of the mean values of the items we clearly can see this tendency towards the "positive + positive" quarter. But the differences still are differentiated enough so that interpretation has been possible.



The numbers of the items are in the order of least important (1) to most important (32).

4. Consequences

While in the times of classical distance education the communication with the student took place mostly via the written assignments to be turned in regularly at a fixed point of time - the drop out study referred to above took these assignments as a criterion - we found in the example from the FernUniversität course (Sonderpädagogik) that the organisational aspects had a strong impact on the retention rate. In the project ÖBO we find similar organisational situations - participants are used to learning, they should be used to systematic learning, we find a homogenous body of participants, regional face to face meetings, regular assessment, fairly job-related content and acceptance by the employer. *So a similar prognosis of retention rate would expect over 80%*. Are in e-learning some specifically different situations to observe? What do the tutors in this e-learning project think is most important?

Organisational aspects of e-learning is a field of didactic research where still much knowledge has to be created! From the list above we do know that these tutors feel that their own preparation for the project has been perfect. We also know that the following organisational aspects have to be observed: support structures, e-mail possibilities, timetable structures and retrievable information about each student.

When we look at the biggest differences of mean values between importance and satisfaction, we also know that regularity of contact is the critical issue. To motivate the students seems not yet to work well enough; to offer individual help seems to be difficult. From the viewpoint of the tutors the crucial elements - in the sense of a construct "urgently needed action" - are: more help and motivation and organisationally speaking: *regularity of communication*. Time will show whether our prognosis of retention rate will hold true and where it will deviate from the hypothesis of influence of organisational aspects for drop-out.

Special thanks go to Dr. Georg Stroehlein of ZIFF who made it possible that the structure of these results of the online questionnaire sent to the participants a week before, could already be presented during the seminar in Potsdam with the tutors on Sept. 30th 2003.

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Author

Dr. Helmut Fritsch
FernUniversität in Hagen, ZIFF
Postfach
D 58084 Hagen
Germany
helmut.fritsch@fernuni-hagen.de

STRATEGIES FOR FACILITATING STUDENT SUCCESS IN ONLINE LEARNING

Mark L. Parker, University of Maryland University College

Abstract

This paper briefly describes some of the initial findings, and responses thereto, of an institution-wide initiative on student retention and success launched by University of Maryland University College (UMUC). UMUC is one of the world's leading institutions offering courses and degree programs to part-time, adult working students. To accommodate these students UMUC has developed an extensive online learning program, consisting not only of fully online courses and degree programs but also the concomitant student services necessary to provide a high quality educational experience to students taking many or all of their courses online. In 2002 the university began a study of student retention and success with emphasis on the online environment.

Early in the initiative three significant findings emerged:

1. Students taking courses fully online are at greater risk of withdrawal from/failure in those courses than students taking courses in the traditional "face-to-face" format;
2. Students who register for online courses late have lower retention rates than those who register earlier; and
3. New online students are at greater risk of withdrawal/failure than returning students.

These findings led UMUC's academic leadership to modify processes and create interventions designed to increase the chances of success of students taking fully online courses.

Background

UMUC is one of the 11 degree-granting institutions that comprise the University System of Maryland (USM). Founded in 1947, UMUC is the only institution in the USM with the primary mission of providing higher education opportunities to adult students in the workforce, including members of the U.S. armed forces and their families living in Europe and Asia. To accomplish this mission UMUC makes use of non-traditional course delivery models, including technology-mediated delivery. Over the past 30 years UMUC has experimented with various distance delivery modalities including interactive television and video, voicemail, and videotapes. In the early 1990s the University developed a proprietary software system (now known as *WebTycho*) for the asynchronous delivery of courses online.

The online approach to distance learning has proven to be the most successful. Enrollments in UMUC's online courses grew from 110 in Fiscal Year 1994 to more than 110,000 in Fiscal Year 2003. The University now offers 18 baccalaureate degrees, 17 master's degrees, and more than 50 baccalaureate and post-baccalaureate certificate programs fully online. In addition to the courses and degree programs UMUC also developed means for providing at a distance such academic and administrative services as digital library access, application for admission and financial aid, and textbook purchase.

The tremendous growth in UMUC online courses and programs posed a number of challenges to the institution. Among these was student retention and success in the online environment. In 2002 UMUC set out to study the issue and to develop and implement, where necessary, interventions designed to increase the rates of student retention and success in all delivery methods, including online.

The Retention Initiative

UMUC's Provost & Chief Academic Officer created a Retention Steering Committee ("the Committee") in September, 2002, and charged it with three principal tasks:

1. to determine the current retention rates of UMUC students;
2. to identify potential barriers to student success and subsequent retention; and
3. to recommend and implement initiatives to help students overcome those barriers.

For its purposes the Committee defined "retention" as the continuation at UMUC, from enrollment in the first course to successful completion of or graduation from a UMUC academic program, by students at both the undergraduate and graduate levels. A "program" is an approved curriculum leading to the award of a certificate or degree. As a principal measure of student success and retention the Committee chose to study the number of students who either withdrew from a course after it had begun or who completed a course but received a failing grade.

Retention and Success Rates

The Committee began by reviewing the results of existing retention-related studies carried out by UMUC's Institute for Research and Assessment in Higher Education (IRAHE); it also obtained specific data from the University's office of Institutional Accountability, Planning, and Research (IAPR) related to retention. Three significant findings emerged from this initial review. First, the data showed that, at both the undergraduate and graduate levels, rates of student withdrawal from and unsuccessful completion of online courses are higher than those of face-to-face courses. Second, it was found that students who registered for online courses during the first week of classes (the so-called "late" registration period) have significantly lower retention rates than students who registered earlier. Third, the data showed that "new" online students are at greater risk of withdrawal or failure than "returning" students.

Factors Affecting Student Retention and Success

In its efforts to identify the reasons for these retention findings the Committee looked at three types of potential barriers to student success:

1. Internal (to the University) barriers, which can be either administrative and academic in nature;
2. External barriers; and
3. Student Factors.

Internal barriers, originating as they do either in institutional processes and approaches to teaching and learning or in student preparedness for university level work (especially in the online environment), were felt to be most susceptible to intervention by the University. Student factors, which include such things as recency and quality of prior education, and external barriers such as US government financial aid regulations and processes, are phenomena over which the institution has much less direct control; nonetheless, the Committee felt that the University could take steps to aid students in overcoming them.

This approach to the types of barriers faced by students – and the susceptibility of those barriers to intervention by the university – is consistent with that found in the current literature on university student retention. For example Lau (2003), in a summary of the commonly acknowledged reasons for student "drop out," lists reasons over which the institution has no control – e.g. changes in students' professional and financial situations – and over which the institution manifestly has control – e.g. failure to create an environment conducive to student success (p. 127). Yorke & Thomas (2003), writing about the retention of university students of lower socio-economic groups, also mention "factors that could influence student success [that are] beyond the powers of the institution (p. 66)," including such things as the availability of transportation to and from the university.

Other writers in the area of student retention, particularly those looking at online study, concentrate on what UMUC describes as potential internal academic barriers to success. Aragon, Johnson, & Shaik (2002), for example, found that the manner in which a university recognizes and responds to differences in learning styles can have an effect on the success of students in both face-to-face and online courses. Scagnoli (2001) emphasizes the importance of early orientation programs to the success of fully online students.

UMUC's Retention Steering Committee proposed two principal causes for the disparity in withdrawal and failure rates between online and face-to-face students: insufficient familiarity on the part of students with the technological and pedagogical expectations for online learning, and insufficient familiarity on the part of faculty with online student behaviors that indicate a potential risk for withdrawal. With regard to the lower retention rates of online students who registered during the "late" registration period, the Committee obtained anecdotal evidence from UMUC faculty to the effect that students who registered and appeared in online courses after the class start date faced two barriers to success: they often did not receive their required texts for several days, and they frequently missed (or had to submit late) the early assignments in the class. Finally, the Committee speculated that student familiarity with online technology and pedagogy was also a key factor in the higher withdrawal and failure rates of "new" as opposed to "returning" online students

Interventions to Increase Student Retention and Success

To address the higher withdrawal and failure rates of online students the Committee ordered an examination of the optional student orientation to online learning, which was known as TOUR101. The working group that examined TOUR101 recommended that the content be brought more closely in line with the specific requirements of *WebTycho* and of UMUC's expectations for student participation in online classes. The group also recommended that the revised orientation be made mandatory for all new online students. The Committee approved these recommendations and in Fall 2003 the new orientation, now known as WEBT101, became mandatory for all new online students. The Committee also felt that the higher withdrawal and failure rates of new vs. returning online students could best be addressed through this revised, mandatory orientation to online learning.

To address the suspected second cause of higher online student withdrawal rates, the Committee approved a pilot Student Persistence Project. The project began with the creation and testing of a questionnaire in Summer 2003 designed to help online faculty identify students who demonstrate at-risk behaviors such as non-attendance/non-participation, poor basic skills in areas such as writing proficiency, and signs of poor time management skills. In Fall 2003 the pilot of the project was launched; faculty members in selected courses were asked to use the questionnaire to identify at-risk students. These students were then referred to special advisors who recommended various interventions to the students based on the nature of the problem.

UMUC had historically allowed registration during the first week of classes in order to give its working adult students, particularly those who were receiving tuition assistance either from employers or from the US government, the maximum amount of flexibility. Because of the lower retention rates of these students, however, the Committee recommended to the Provost that UMUC's academic calendar be adjusted so that "late" registration took place during the week prior to the start of classes. This change went into effect in the Fall 2003 term. The Committee also approved additional initiatives aimed at helping students to complete the process of applying for financial aid earlier.

Lessons Learned and Next Steps

As this brief summary of the UMUC retention initiative to date has shown, barriers to student success and retention can arise from administrative and academic practices within the institution itself as well as from external influences on students. An institution dedicated to improving student success must be prepared to consider changing long-standing practices in addition to investing resources in more direct interventions such as orientations and outreach activities.

As of this writing the Committee is gathering and evaluating the results of the initiatives described above. The principal early indicator of success will be the Fall 2003 withdrawal and failure rates of the students affected by the initiatives. The Committee will also track the long-term success of these students throughout their academic programs.

The Committee is also monitoring a number of other retention initiatives begun in 2003. These include the development of a profile of students who may be at risk of withdrawal or failure; surveys of students who elect to leave the university without having completed their studies; analyses of courses that students typically take early in a degree program and that have high rates of student withdrawal and failure; and the review of university policies that govern the number of courses that a student may take in a given academic term. UMUC hopes that these and other retention initiatives will provide its students with the tools necessary to succeed in their chosen academic endeavors.

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Author

Mark L. Parker
Executive Assistant to the Provost and
Adjunct Associate Professor
University of Maryland University College (UMUC)
3501 University Blvd. East
Adelphi, MD 20783/USA
mparker@umuc.edu

RETENTION AND COURSE CHOICE IN DISTANCE LEARNING

Ormond Simpson, The Open University UK

Introduction

It is a widely held view that that process of course choice is an important factor in new students' subsequent retention or dropout – see for example McGivney (1996). A student making an inappropriate choice - either the wrong level of course for them or the wrong content - is thought much more likely to dropout than a student who is on a course for which they are suited by both level and content.

Amongst distance education students some clear evidence comes from the annual survey of withdrawn students in the UKOU Institute of Educational Technology (2002). In this survey 'inadequate course choice guidance' is the second most chosen item after 'insufficient time' as reason for withdrawn students' greatest dissatisfaction – some 21% are dissatisfied with this aspect of their studies.

Making course choice decisions

Students can make course choice decisions using various materials such as course titles and descriptions, guidance, other students' opinions and 'taster' materials.

Course titles and descriptions

Most distance students will decide on their course choice from the course descriptions provided by the institution. There are a number of issues around such titles and descriptions:

- Length. If descriptions are short then they are likely to be incomplete in some respects or at least to lack comprehensiveness especially in the case of long courses covering considerable ground. Long descriptions may be relatively impenetrable.
- Vocabulary. The vocabulary available to course description authors may be inherently imprecise. Authors often use terms such as 'explore', 'describe', 'advanced', 'elementary' and so on which allow for wide interpretations by the intending student. Even where descriptions are written in terms of outcomes these may not be clear to students who may not understand an outcome stated in unfamiliar terms. It may be little help knowing that a course will give a 'thorough understanding of vector algebra' if students have only a very hazy idea as to what vector algebra is.
- Conflict between recruitment and retention (Simpson 2003). A course description may be written with the subsidiary aim of encouraging recruitment onto a course. In such cases there may be a conscious or unconscious temptation to emphasise the accessibility of the course at the expense of its difficulty.
- Assumed entry behaviour. Course descriptions can specifically address potential students' entry requirements both in terms of the previous knowledge assumed and the skills required and this may be one of their most valuable functions. However knowing that a course assumes potential students have a particular previous qualification does not tell them that it is definitely suitable for them nor does it help students who do not have that qualification but who might be able to study the course.

It may not be enough therefore to rely solely on course descriptions for getting students onto the best course for them.

Course choice guidance

The most obvious route to ensuring that students get the right course for them is to offer them advice from a course choice adviser. However again there are a number of issues around this approach:

- One to one advice is expensive for an institution to provide, particularly in mass distance education. The UKOU has 35000 new students each year and a staff of around only 35 trained advisers. So it is inevitable that most new students will not be in a position to speak to an adviser at any length.
- Potential students may not find it easy to frame the questions they should be asking about a course. A skilled adviser can clarify but this can be a lengthy process.
- Advisers may have the generic skills to advise on course choice but not necessarily the detailed knowledge of a particular course to answer all the possible questions that might be asked. In that case processes of referral or information gathering may be needed which add to the cost and length of the process.
- Students in distance education often appear reluctant to seek advice. The proportion of students seeking course choice advice from an advisor by any route in the UKOU is probably only about 10% of the students choosing courses in any one year.
- There is evidence that even where students receive advice that they ignore it. Johnson (2000) reported on a follow-up of advice given to a number of UKOU students whose course choice appeared to be unsuitable. Although the advice had the effect of getting students to reduce the number of courses they were taking it did not usually make them change their course choice. Once having made their choices students were clearly committed to them.
- Finally access to guidance may be difficult for some students – as Clayton and McGill (2000) note those who could most benefit from guidance are often the least able to access it for reasons of remoteness, unassertiveness and so on.

Attention has therefore turned to alternative methods of providing course choice advice ‘reflexively’ – that is a potential student ‘self-advises’ as a result of working through different kinds of materials. There are a number of different methods.

Students’ Comments on courses

Potential students will value the views of students who have taken courses previously. This is not to say that students will be guided entirely by such views but that they are likely to be factors in students’ decisions.

In 1996 some UKOU students who had recently taken courses were invited to write a short note (100-200 words) aimed at advising new students considering taking the course they had just finished. These were lightly edited and collated into single sets for each course.

The comments are now supplied as hard copy and on the web – www.open.ac.uk/courseviews. Each of about 150 undergraduate courses has a set of comments – usually containing about ten or so individual comments from individual students thereby giving a number of alternative perspectives on the course. This is a typical comment for course A210 ‘Approaching literature, authors, readers and texts’:

"A highly rewarding and stimulating course, but demanding in its reading requirement. An open mind is needed to make the most of the course. Those who resist the course's call to approach and explore literature in a variety of ways waste energy and miss out on some of its riches. Those who tackle the course in a positive way will find much that is both challenging and enjoyable, and have their literary horizons permanently widened."

There were initially some concerns that comments might be overly critical, negative or simply unfair. This has not turned out to be the case at all. There are negative comments but they are almost always in the context of a balanced opinion. For example it is not at all unusual for students to criticise the

work load of a course as very heavy but add that providing one can handle that it is an exciting and worthwhile course. Indeed the overall tenor of the comments is usually very positive whilst realistic about the challenges that the courses represent.

Evaluating the Students' Comments

It is hard to assess the effectiveness of the Students' Comments in terms of ensuring that students make the best course choice for themselves. There are various evaluations however:

- Site usage

The site has steadily increased in popularity and 'hits' are running at around 850 a day.

- Student and tutor feedback

The site allows students and tutors to send feedback. This is consistently positive:

An example of feedback to the Student Comments website:

'An excellent idea! I wish it had been in place last autumn, it would have made my choice much easier I absolutely love this page and find it the most useful and interesting way to get a really good feel for the course and what is on offer. I shall soon compose and send my thoughts on a wonderful A103 year.'

Interestingly some of the comments suggest that students are using the site for preparatory advice as well as for course choice. This may mean that the Students' Comments have a particularly important role to play for new students.

Students Comments - the political dimension

This has always been a difficult project for the UKOU as in a typical recruitment versus retention dichotomy course teams are uneasy with the idea that students' comments on their courses can be seen so widely. Indeed in order to protect the project the originator arranged that it should come under the aegis of the Open University Students Union. Nonetheless the comments are still not linked from any of the UKOU's official course information web pages presumably because of uneasiness that such linking would provide an official imprimatur.

However the political environment is changing. Last year the Higher Education Funding Council for England and Wales produced a report ['Information on quality and standards in higher education' HEFCE 02/15 March 2002 informally known as the Cooke Report] which recommended that universities in the UK be required to publish information on the quality and standards of their teaching and learning. The information published should include the outcomes of student satisfaction surveys. This in turn was based on Australian practice which requires universities to place student feedback on the Web.

Subsequent to the report the HEFCE issued a circular to all UK universities in which it announced its intention to pilot a similar activity in the UK which would include student feedback ['Information on quality and standards: pilot of recommendations from the Cooke Report' HEFCE 04/2003, 7 February 2003]. There is a problem from Australia that response rates there were sometimes too small – some courses received only one or two comments thus potentially distorting the judgements. It is not clear how many comments are needed to give a fair judgement but the average number of about 10 comments on each course on the Students' Comments may be a good balance between fairness and overkill.

Students' Comments – the costs

To some extent student comments become now self generating as sites can be designed to allow students to send their own comments to a designated email address. They can then be edited and placed on the site. For the 200 or so courses on the UKOU website the annual costs amount to only

about £1500 pa. There is therefore a powerful case both in political and financial terms to maintain and develop the Students Comments.

Students Comments – live

The use of computer conferencing can allow potential students to ask questions of experienced students directly on line. There is an example on the Bart's Medical School site where school students can post questions which are answered by current medical students:

From Little-Samantha Status: Final Year School pupil (Y11)

Hi everyone,

My boyfriend is interested in medicine, but seems to have a little phobia of the good ol' red stuff. Small amounts are ok (I think), but he watched a surgery programme on TV once and felt sick to his stomach. So to those med students (or anyone with work experience): have you ever felt a little squeamish, and how have you dealt with it? Is it something you all just get used to? Thanks a lot.

P.S. exams over with now. Just a long wait until August 22nd. ;-)

From tig Status: medical student (yr-3)

I can't watch surgery on tv..... in real life.. fine! on tv everything is distorted and I am very squeamish!

From azy_cool Status: 1st Year Medical Student at Manchester

I was a little squeamish before I started, when looking at surgery on tv etc, but I used to watch it cos it was interesting and it got 'easier' to watch the more you watch it .. so he can try that, Operation comes on the Discovery channel most nights I think? In medicine having to cut up dead bodies .. that does sound quite bad, but really it was fine, even the first lesson was fine,

I think tig is right its much easier in real life then on tv ... if he really wants to do medicine then being squeamish shouldnt be a problem yet, Im sure he'll be fine when he starts.

Students comments – the limitations

Students' comments are of course limited in value. They cannot tell students that they have the right background for a course and they will always represent partial views of courses.

Course Preview Materials - 'Taster Packs'

Taster packs have a long history in distance education and early examples were produced by the National Extension College in the early 1980's. They were introduced by the author of this article in the UKOU in 1986 for the then foundation courses.

The original rationale was a simple one: students considering a particular course should have the opportunity of surveying the materials and undertaking a short 'test drive' of that course. The reasons for using specifically designed materials for the purpose were two-fold:

- Cost - in theory in distance education all the course materials are available in written form so there should be no barrier to potential students browsing through an entire course at leisure to see if it suits them. In practice the cost of sending an entire course would clearly be prohibitive and lending them is impossible in view of the number of potential students.
- Typicality - a complete UKOU course can consist of 30,000 words or more. Even if potential students could get their hands on a course it is clearly unfeasible to do anything more than read through a few of the pages of one of its constituent units. But then individual units may be untypical of the course as a whole.

It seemed better therefore to select short samples of the course which were thought to be reasonably typical. It was easy to add examples of assessment materials such as an assignment with a tutor's comments and grade and an exam paper in order to give students some kind of feel for the level of work they would have to produce at some point.

Once again there were recruitment versus retention concerns. For example it was thought that such packs would deter students from studying a course. In order to deal with this each pack came with an explanation of the pack's purpose and a 'health warning' pointing out that it might contain material that relied on knowledge gained earlier in the course.

Of course the intention of such a pack is to deter students from taking a course if either the content is not relevant to their needs or at the wrong level. There would be cause for concern if it was found to be deterring students from a course that was right for them. In fact Adams et al (1989) found no evidence for that belief and student feedback was uniformly positive.

Student feedback on taster packs

These are selected at random from several hundred comments:

*Interesting, informative. Challenges thoroughly paraded. Thanks for the health warning!
Excellent resource, certainly helped me in making the right decision for my future.
Very helpful – assisted in my decision to go ahead with this course this year.
Many thanks for the taster pack. I found it very interesting, giving an insight as to the work involved. Enough to prepare – enough to scare!*

It is always difficult to evaluate such feedback as students who have negative responses may not bother to feed those back. But the uniformity of positive response is remarkable. The feedback reveals that potential students find the packs reassuring rather than off-putting. To a potential student a course represents an intimidating unknown and there must always be the question - 'can I cope?' To see a typical selection from a course and realise that although it may be challenging it is not completely unintelligible may overcome fear of that unknown.

Course Preview materials – the cost

One of the attractions of preview materials is that because they are derived from existing course materials they are inexpensive to produce. There are costs in deciding what selection of material should be used but these are one-off costs which can be amortised against the life of the course. Thus in the UKOU the editing cost of producing a Taster Pack for a course is around £100 and the reproduction costs are around £1 per pack. Thus Taster Packs may represent a cost-effective advisory method.

Course Preview materials – the limitations

Preview materials cannot tell students that they have the right background knowledge for a course and are limited in that respect.

Diagnostic materials

Diagnostic materials have long been used in open and distance learning to advise students about their study choices. There are essentially two kinds – generic, to test applicants' suitability for higher education and course-specific, to test suitability for a particular course. Both can be either externally- or self-assessed. In addition it is possible to argue that diagnostic materials can assess either skills or knowledge although it is not clear how easy it is to make this distinction in practice.

- (a) *Generic externally assessed diagnostic materials* range from the massive externally assessed 194 point questionnaires such as the Noelle-Levitz test used in the US to identify vulnerable students, to the simpler test devised by Johnston at Napier University (described in Simpson 2003) used in conjunction with an interview with a student's tutor.
- (b) *Generic self- assessed diagnostic materials* have been less used. An example is given in Simpson (2003) of a test developed from a statistical analysis of the characteristics of successful students in order to help potential students work out their predicted probability of success and see if they can

change characteristics [such as low entry qualifications] which could increase their chances of success. But this has not been evaluated.

- (c) *Course-specific externally assessed materials* where a potential student takes a test which is assessed by a member of the institution are relatively simple to design although for Open Learning institutions they may resemble entrance exams too closely for comfort. They will also be expensive and in trials in the UKOU where they were voluntary it quickly became clear that the potential students who submitted them were the students least likely to need to do so (Ashley 1986).
- (d) *Course-specific self-assessed materials* appear to be more suited to mass distance education. However there are still difficult issues. It is relatively easy to design self-assessed diagnostic tests where the answers are clearly correct or incorrect as in maths science and technology subjects. It becomes more difficult where more advanced courses with some background knowledge and skills are needed such as such as courses in higher level arts or social science subjects.
- (e) It is also possible that a 'recruitment versus retention' dichotomy can occur. It can be hard for a diagnostic test writer to give 'you shouldn't be taking this course' as a possible outcome when there is pressure to recruit students onto a course. There will be a temptation to argue that a diagnostic test result should be less directive and leave the door open to students by saying something along the lines that 'you will find this course a challenge unless you prepare for it carefully' instead. In one of the few evaluations of course-specific self-assessed materials Williams (2001) found that UKOU science diagnostic quizzes which used such rubrics were not as effective as she hoped in persuading students to change their course choice. But that finding may well be specific to the quizzes concerned.

Whatever the type of diagnostic material there appears to have been little work published on their effectiveness in getting students onto the correct courses. And diagnostic materials may not be sufficient in themselves as whilst they may tell a student that he or she is at the right level for a course they may not tell that student that the course has the right content for them.

Conclusion

All the methods described here for course choice have their limitations either in terms of their cost or the partial view of courses that they provide. Perhaps the best route to a satisfactory course choice system is to borrow a concept from social science – that any reality can only be fairly represented by a set of 'competing perspectives' and that a concept as complex as a course needs the perspectives of descriptions, previews, comments and diagnostic materials in order to describe it completely. How students will react to such a package of perspectives and whether it will be too much for any one student or whether different students will choose those perspectives that give them the best 'feel' for a course remains for further research.

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Author

Mr Ormond Simpson
Open University in the East of England
12 Hills Road
Cambridge
CB2 1PF
England
o.p.simpson@open.ac.uk

SUSTAINING ONLINE COLLABORATION: SEVEN LESSONS FOR APPLICATION IN THE VOLKSWAGEN AUTOUNI

Lisa M. Blaschke

Introduction

Team building is a challenge in face-to-face environments – and even more so when conducted at a distance. Volkswagen’s (VW) AutoUni is tasked with not only building successful teams with corresponding results, but also nurturing, sustaining, and maximizing those teams over time and distance. AutoUni’s key challenge of getting teams to sustainably share and create knowledge is coupled with that of creating a blended environment of online and face-to-face collaboration, while conquering the evolving knowledge management and learning frontier. AutoUni requires a strong framework as the foundation for its online education activities; with that in mind, this paper reviews the current research and best practices in e-learning and online collaboration and defines seven important lessons for sustaining collaborative efforts in an online environment.

Current Research and Best Practices

Meister [1] predicts that the skills of communication and collaboration will be of growing importance in the twenty-first century organization. Online collaboration can be an effective approach to cognitive and social learning through formation of a collective intelligence actively created from team members’ ideas, associations, and structuring of information and the team processes themselves (Harasim [2]). The resulting virtual teams will make organizations more dynamic and able to respond more quickly to global demands, as well as expose employees to new ideas, cultures, and new ways of doing business (Jarvenpaa & Leidner [3]). With the growing trends of global expansion and international, virtual teams, the challenge becomes creating and sustaining collaborative efforts in an online environment – without losing the dynamics that make teams successful. The following seven lessons build on current e-learning industry research and best practices for forming and sustaining successful collaboration at a distance.

Lesson 1: Promote a learning culture where knowledge generation and sharing is openly desired.

First and foremost, it is integral that a learning culture – one which encourages and supports learning and open distribution of knowledge – is prevalent within an organization. Rosenberg [4] calls for an “environment and a culture that encourages knowledge generation and sharing, supports an atmosphere of learning from mistakes, and assures that what is learned is incorporated in the future activities, decisions, and initiatives of the firm” (p. 14). This learning culture must be promoted at all levels of the organization – starting at the top.

Leaders build visions of a learning culture and then work to implement them through their strategic plans and their example and support. Meister [1] found that the average CEO spends at least one day a month facilitating learning in his/her organization: being involved in workout sessions, presenting values and vision at new hire orientation sessions, and facilitating senior management training. Such involvement “promotes a culture of continuous learning and helps to transform the organization” (p. 50). Berge [5] also calls for the support of the top leaders in an organization, which is exhibited through their enthusiasm and hands-on involvement – and their willingness to provide financial support when and where needed. Without the support of top management and key leaders within the organization, enterprise-wide training initiatives are almost certain to fail. Identifying leaders who will cultivate and propagate a learning culture is essential; in some cases, it may even be necessary to show management examples of successful learning cultures, for example through case studies.

Culture building strategies include making management accountable for learning, initiating change at the enterprise level, making learning part of the job, making everyone a teacher, designing good courses, certifying learners, paying learners to learn, and making learning accessible and affordable (Rosenberg [4], pp. 185-189). Show-casing best practices within the organization can also encourage and cultivate a learning culture; blatant indoctrination of the learning culture can also be effective, for example through team workshops and management training. However, a culture of learning can only be created and sustained when top management leads by example. Leaders who strictly go through the motions and do not reflect the characteristics of a learning culture will not achieve the desired results in their organizations.

Lesson 2: Cultivate and capitalize on learning champions.

Learning champions are the next critical element that must exist within an organization in order for e-collaboration to succeed. Learning champions are the people who emulate the art of online collaboration by practicing it daily in a variety of forms – and by preaching its benefits to non and new practitioners. They are also the people who jump in when online collaboration attempts begin to struggle or falter. Learning champions should be at all levels of management, including the CEO.

Involving top leadership and management in the promotion of online collaborative activity has the greatest impact on the success of those activities, assures credibility, and ensures buy-in (Jones & Laffey [6]). The influence of champions through resource allocation and making rewards available also lends itself to successful collaborative efforts. Driscoll [7] recommends having a powerful and visible champion for online projects, a person who can “hold people accountable for deliverables, create working relationships between cross-functional groups, and make scarce resources available” (p. 229).

Numerous successful institutions have utilized learning champions within their organizations. The U.S. Army Intelligence Center implemented an adhoc task force called the *Tiger Team*, individuals who believed in the program and who represented requirements of key stakeholders (Ellsworth & Iorizzo [8]). SBC Communications, Inc. found that when top leadership believes in the program, better planning, teamwork, and support are the results (Friend & Hepple [9]). The support of key executives was critical to MCI WorldCom’s e-learning program and also built up relationships within the organization (Treanor & Irwin [10]). Ford also utilized champions, additionally stressing the importance of ongoing care and maintenance of designated champions (Dessinger & Conley [11], p. 197).

Upper management support is not the only important factor in determining project success – the significance of grass roots support cannot be overlooked. To obtain this support, extensive internal public relations campaigns may be necessary, for example via the company newsletter and intranet sites, personal communications, and even an awards program. Sometimes the simplest, although most work-intensive, solution is through one-on-one interaction (see Covey’s [12] practice of empathic listening); this solution can be particularly effective in rooting out and winning over the opposition. The involvement and influence of learning champions is a precursor to achieving this cross-organizational support.

Lesson 3: Build trust and relationships in teams.

Covey [12] calls trust “the highest form of human motivation”; where high levels of trust exist within an organization, communication and cooperation are high, and are accompanied by synergistic, win/win results (p. 178). Likewise, where trust is low, levels of communication, support, excitement, and cooperation are low (Jarvenpaa & Leidner [3]). Palloff & Pratt [13] have found that before participants can form connections with each other and offer honest and open feedback, a sense of safety and trust must exist.

The initial establishment of the team seems to be the most critical phase, and exchanging open and thoughtful messages at the start is important in ensuring a team’s viability. Quality and predictability of online interactions – not necessarily the quantity – are also key to sustaining interaction. Participants should be timely with reports and provide thorough feedback to team members. Team

member qualities like responsibility, dependability, independence, and self-sufficiency are essential; trust-building activities, such as volunteering to complete tasks and social communication, seem to strengthen and unify teams (Jarvenpaa & Leidner [3]). Recognizing team needs and showing team members the personal and business benefits of team collaboration is also a motivating factor in sustaining collaboration, as participants need to have a sense of the added value that collaboration brings to their actual work (Jones & Laffey [6]; Birch [14]).

Online team members can be easily alienated and by personally meeting team members, an elevated sense of community can be achieved (Collison, Elbaum, Haavind, & Tinker [15]). If this isn't possible, another way to achieve a sense of community is by posting photos of team members. Collison et al. [15] recommends acknowledging team member emotions, since a potential breakdown of communication can occur when emotional undercurrents are ignored. By working through the emotions, teams more firmly establish trust levels and relationships. Birch [14] states that building relationships is an important skill when collaborating virtually, and to be effective, online collaborators need to be ready to clarify points rather than jump to conclusions.

Within an online environment it can be difficult to develop the kind of spontaneous team relationships that form over a cup of coffee or at the water cooler in face-to-face environments. To get around this, NCR provided its employees with the videoconferencing “wormhole” – an online socializing area, much like a corporate water cooler (Lipnack & Stamps [16]). The Teacher Learning Conference (TLC) also implemented an online socializing tool, called the “Water Cooler” discussion area, where team members could get to know each other, as well as provide assistance to other team members (Collison et al. [15], p. 85).

Trust-building activities such as problem-resolution activities (e.g., case studies, brainstorming) in an initial face-to-face or online environment can promote and nurture trust, producing positive results in establishing a foundation of trust within a team and a strong basis for future online collaboration. Once online, team members need to watch for warning signs of diminishing trust in online collaboration efforts, for example, abrupt reduction of posts or no posts at all, unanswered posts, posts displaying an “I-don't-care-you-decide” attitude, and lightly veiled anger and/or frustration in posts. Confronting and resolving issues can build trust as well as team member relationships. “Off-line” discussions, for example through follow-up telephone calls, can assist in resolving conflict and building trust.

Lesson 4: Make use of organizational and knowledge management tools and methodology to keep communication flowing.

Without effective communication, online collaborative efforts can become fragmented, leaving participants with feelings of isolation and confusion. For collaboration to be successful, there should be preparation, organization, and management of the collaborative process. Guidelines for improving communication when collaborating on online projects include the following: clearly state the project purpose, strategy, and expectations; clearly define responsibilities to avoid confusion and frustration; provide communication guidelines; communicate on a regular schedule; define goals and objectives – most importantly *shared* goals and objectives; define conflict-management and resolution processes, and address conflict immediately; formulate tasks briefly and clearly – and make sure team members understand them; use clear, concise, and straight-forward language; establish a moderator and timeframe for synchronous discussions; and provide a documented summary of all discussions (Burge & Roberts [17]; Richardson & Turner [18]; Jarvenpaa & Leidner [3]; Palloff & Pratt [13]).

Benchmarks for success of the online collaboration, as well as expectations and assumptions, should also be clearly identified and documented (Driscoll [7]). A chart with tasks to be completed – and how the tasks relate to each other – should be developed and shared with the team. Prompt communication about design, changes, deadlines, and other project-related issues must also be managed. Gamonal [19] advises using the best tools available, planning around peak availability of team members, grouping team members by geographical location where appropriate, showing sensitivity to different cultures, and using simple language with pictures/diagrams.

Making sure that team members have access to information – for example via a learning portal on the company intranet – is also integral to sustaining collaboration. Team members need access to just-enough and just-in-time information, and intelligent knowledge management is essential. NCR credits its success in online collaboration to its “Global Realization Process,” a comprehensive planning and project management system that tracked and measured teams’ progress monthly, weekly, and daily (Lipnack & Stamps [16]). To keep their teams informed, UAW-DaimlerChrysler utilized online directories of team members and a project management Web site (Codde, Egidio, Boatwright, Zahn, & Czarnik [20]).

The author’s collaborative team efforts within the Master of Distance Education (MDE) program at the University of Maryland University College have shown that choosing a leader at the onset of a project can help keep communication lines open and projects on track. With team input, the leader can identify action plans and prepare project time schedules; however, team members should have the freedom to decide which activities they will participate in, as assigning tasks without team input can be detrimental to team morale.

Lesson 5: Use face-to-face and online interactions appropriately.

Gamonal [19] recommends that online project teams meet face-to-face three to four times annually. Face-to-face interactions should be organized for new project kickoffs, brainstorming sessions, problem solving sessions, welcome sessions, and milestone celebrations. NCR’s Roberson (in Lipnack & Stamps [16]) reiterates this, stating: “You still need all-hands meetings. With all this wonderful technology and shared information, they still don’t replace the need to get together with the whole team in a particular site and communicate with them on what’s going on, on what the direction is, and on the importance of their contributions” (p. 6). UAW-DaimlerChrysler also used occasional face-to-face meetings on an as-needed basis (Codde et al. [20]).

The author’s professional and education experience supports Gamonal’s findings, especially the importance of face-to-face interaction in the early phases of a project. Face-to-face interaction is also extremely beneficial, as well as motivating, when complex problems must be addressed and when projects lose direction.

Lesson 6: Provide the necessary infrastructure and technology to sustain online collaboration.

For online collaboration to flow smoothly, the necessary technological and organizational infrastructures must be in place. For example, there needs to be a strong relationship between IT and the training department, and there must be comprehensive technical support for faculty and learners (Bates [21]). The software and hardware environment should make team members feel comfortable, thereby contributing to team members’ sense of safety and security within the environment (Palloff & Pratt [13]). UAW-DaimlerChrysler addressed increased technology and Internet requirements in their strategic planning (Codde et al. [20]), while Ford’s support infrastructure included a high-level oversight committee of senior management to help quickly resolve and overcome process and technical infrastructure problems (Dessinger & Conley [11]).

Interface design of the online collaboration tools needs to be simple and easy-to-use. When usability is compromised, team members spend more time trouble-shooting than on working on project activities. A confusing interface design can also create feelings of discomfort and confusion for team members, which can lead to reduced participation. Formal or informal project guidelines and processes can also create infrastructure within teams, as well as help team members feel more comfortable working in an online environment (i.e., rules are clarified from the start). It is also essential to choose a communication media that is accessible to all team members; using media not available to the entire team can lead to a sense of alienation and isolation in non-participating team members.

Ravitz’s [22] model for building learning communities is based on an ISD process of management (creating the development team), front end analysis (selecting a theme, identifying resources), design (providing communications tools, identifying shared interests and teams), development (develop projects), implementation (producing work, sharing process information), evaluation (assessing

published work, providing feedback, evaluating the system), and dissemination (sharing process information, outcomes, and useful products) (pp. 300-303). For each phase of the process, Ravitz proposes formative questions which serve as checkpoints to ensure that lines of communication remain open, such as: Is the team responsive and demonstrating shared understandings? Is there sufficient interest? Are people sharing ideas and plans, and receiving feedback during development? Processes need to be reviewed and revised based on continuous feedback. SBC evaluates and improves its processes through mechanisms such as templates, standards, quality assurance processes, and process improvement teams, and applying common solutions across projects (Friend & Hepple [9]). It is beneficial to have someone within the team who measures the climate of the collaboration – is the online project moving in the right direction? Are there potential pitfalls? What is the general feeling of the group? This person keeps the project moving along if it begins to stagnate. While this role can be assumed by the leader, another team member may also take on the responsibility.

Lesson 7: Be flexible – and ready and willing to adapt to change.

Jones & Laffey [6] find that there must be continual learning and a willingness to adapt to change within a learning organization, and that online collaboration opens up a wide range of possibilities for implementing knowledge management. Ford employees Dessinger & Conley [11] write: “Change is ongoing in open systems, and change without change management will ultimately kill a system” (p. 197). The Réseau INTERACTION Network (RIN) credited its flexibility to adapt to changing needs as a key success factor (Larocque & Thomas [23]). DaimlerChrysler found that to gain a competitive advantage, their global workforce needed to be “knowledge driven, collaborative, and able to deal with an accelerating pace of change” (Codde et al. [20]).

What It Means for VW

AutoUni’s motto that “knowledge is the key!” provides valuable insight into AutoUni’s commitment to and support of a learning culture. Its practice of gaining new approaches to solutions and ideas based on scientific theory, its transdisciplinary approach, its integration of technical, commercial, intellectual, and sociological aspects into its teaching, and its innovative organization, teaching, learning, and think tank strategies are all examples of how learning is valued in the organization. AutoUni’s unique and innovative education structures, particularly the AutoUni^{QUE} platform, think tank, and qualification lab, and its usage of the latest in teaching and learning methods demonstrate AutoUni’s readiness to manage change within its organization. By developing its own learning and knowledge platform to support its processes, AutoUni is also establishing the necessary infrastructure for organizing its collaborative efforts. AutoUni’s research approach of shortening the distance between research and business will be instrumental in creating synergy and innovation in the workplace (Volkswagen AutoUni website [24]; Logassi & Gagnebin [25]). And by placing 250 million Euro into the AutoUni program, VW’s senior management is firmly committing itself to the importance of learning in its organization (Barthold [26]).

Summary

To sustain a collaborative environment where knowledge is continually shared and generated, fundamental elements of trust and organizational discipline must exist within online teams. Not only must this trust and discipline exist, but it must be cultivated and nurtured over time. A learning culture needs to pervade all levels of the organization, and a technological and procedural framework for supporting online collaboration must be established and continually evaluated for improvements. Champions can be the most significant factor in sustaining online collaboration over time, and they will need to be identified and supported within the organization. By heralding online collaboration, learning champions can ensure the continued propagation and distribution of knowledge and learning in virtual teams. Finally, an organization must be both willing and capable of adapting to external and internal forces of change. These combined lessons form a comprehensive set of guidelines that can be applied within a learning organization in order to ensure the organization’s success in continued open communication and learning.

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Author:

Lisa M. Blaschke
MDE Student
Kreative Kommunikation, LLC
Im Klipfel 11, 69254 Malsch
Germany

SUSTAINABLE COLLABORATION – OVERCOMING THE FRONTIER BETWEEN LEARNING AND KNOWLEDGE MANAGEMENT AT VOLKSWAGEN’S AUTOUNI

Gertrude Dudink

Introduction

With the advent of the “knowledge economy”, companies face an increasing challenge in managing their past, present and future knowledge to maintain or enlarge their competitive advantage. At the Volkswagen Group, various knowledge management projects have recently been synchronized in order to implement and roll out a company-wide knowledge management strategy. Moreover, Volkswagen has created the AutoUni, a corporate university aiming at educating the company’s high potentials on a recognized academic level, at the same time generating applicable knowledge for the company. How can this initiative be integrated into the company’s overall knowledge management strategy?

Knowledge Management

First of all, we will need a definition of knowledge management that truly captures the challenge of the effort. All too often, knowledge management has been defined as a technological effort to capture and provide access to information available in an organization. Brown and Duguid (2002) warn against this unproductive approach of confusing information with knowledge. The main difference lies in the “personal attributes” of knowledge: it entails a knower, because of which knowledge is harder to detach than information, and knowledge is not something that is “held”, but rather “digested” (pp. 119-120). Nonaka (1994) describes the difference as follows: “In short, information is a flow of messages, while knowledge is created and organized by the very flow of information, anchored on the commitment and beliefs of its holder. This understanding emphasizes an essential aspect of knowledge that relates to human action.” (p. 15). He also identifies two types of knowledge, the latter of which causes the main problems for effective knowledge management: “‘Explicit’ or codified knowledge refers to knowledge that is transmittable in formal, systematic language. On the other hand, ‘tacit’ knowledge has a personal quality, which makes it hard to formalize and communicate. Tacit knowledge is deeply rooted in action, commitment, and involvement in a specific context.” (p. 16).

A productive approach to knowledge management would therefore specifically need to address the human side of knowledge – how it is acquired, generated, used by people – and how the organization can contribute to and profit from these processes. Kessels (1996) calls this the “knowledge productivity” of an organization: “The ability to gather information, generate new knowledge, disseminate, and apply this knowledge to achieve improvement and innovation” (§ 2). The facilitation of knowledge productivity, then, should be the true function of knowledge management. This aspect is incorporated in Rosenberg’s (2001) definition: “Knowledge management supports the creation, archiving, and sharing of valued information, expertise, and insight within and across communities of people and organizations with similar interests and needs.” (p. 66).

Learning at the AutoUni

The educational philosophy of the AutoUni is described on its website (www.autouni.de). Its main features are:

- The use of real-life problem cases
- Working in transdisciplinary teams
- The integration of technical, commercial, intellectual, and sociological aspects

A combination of flexible (e-learning) facilities and face-to-face venues is envisaged to arrive at a form of “blended learning”.

From the description it becomes clear that AutoUni’s educational philosophy is rooted in constructivism. Merrill (1992, p. 102) sums up the assumptions of constructivism as follows:

- Learning Constructed
- Interpretation Personal
- Learning Active
- Learning Collaborative
- Learning Situated

In the next section, I will attempt to show how these assumptions can be integrated into the AutoUni learning environment in such a way that the knowledge management effort of the organization will benefit from it.

Integrating Learning and Knowledge Management

In the introduction, we have seen how the focus of knowledge management has shifted from mere information towards knowledge as an attribute of people. A related shift can be identified, away from archiving existing information towards the creation of new knowledge. “Any organization that dynamically deals with a changing environment ought not only to process information efficiently but also create information and knowledge.” (Nonaka, 1994, p. 14).

Referring back to the assumptions of constructivist learning, we can see the overlap with the newer conception of knowledge management: active construction, the personal aspect of both knowledge and learning, the collaborative aspect of learning (sharing knowledge), and their social context (“situatedness”).

Nevertheless, some attempts at integrating especially e-learning and knowledge management seem to fall back on the information and technology centered approach (cf. Barron, 2000; Lamont, 2003). The focus on reusable learning objects, just-in-time and just-enough learning, electronic performance support, despite their usefulness in various contexts, again seems to imply that information, knowledge and learning are the same or interchangeable, and require the same type of input.

For an academic environment as the AutoUni, such an approach will not do. The AutoUni is clearly aware of this, as follows from its educational philosophy. Although technology will form a major factor, it will be used to facilitate learning and knowledge creation according to the constructivist principles summed up above.

A practical approach

“Knowledge in all its multitudinous forms clearly stamps the products and services that can make the difference on the market, contribute to a positive brand image, and create competitive advantages. Bringing out these forms of knowledge and making them available is a core task at AutoUni.” (www.autouni.de/english/philosophie.html). Even though the new paradigms of learning and knowledge management have a lot in common, the major risk is that the knowledge created at AutoUni will remain within the boundaries of AutoUni and in the heads of its students, without being assimilated by Volkswagen. Brown and Duguid (2002) label this “sticky knowledge” (p. 150). Therefore, we will need to find ways to ensure the free flow of knowledge between the AutoUni and the company.

Computer Mediated Conferencing

Even though e-learning offers a wide variety of technologies to promote learning, from simple e-mail based applications to advanced applications such as games and simulations, I will focus here mainly

on Computer Mediated Conferencing (CMC), a relatively low-tech application that is nevertheless capable of effectively addressing most, if not all, constructivist assumptions of learning. CMC allows both instructor and students to post messages to a general discussion area, forming threaded discussions and creating new ones as they go along. Unlike chatting, CMC is conducted asynchronously. “Asynchronous conferencing can be seen as a hybrid medium sharing the communicative interactivity of ‘speaking to each other’ and the stability of the textual medium, which facilitates analysis and invites reflection.” (Hülsmann, 2003, p. 85).

Provided CMC is consciously designed towards these aims, it will allow students to construct their own meaning, both individually and collaboratively, to learn actively by contributing to the discussion, and to engage in situated learning insofar as authentic contexts are provided and real-life experiences are integrated.

Communities

Given the social context of learning that is assumed by constructivist theory, the learner needs to be part of a community within which knowledge can be constructed and shared. Palloff and Pratt (1999) define the key concepts of successful learning communities as follows: ‘*honesty, responsiveness, relevance, respect, openness, and empowerment*’ (p. 20). They also summarize the basic steps that must be taken to build a learning community (p. 24):

- Clearly define the purpose of the group.
- Create a distinctive gathering place for the group.
- Promote effective leadership from within.
- Define norms and a clear code of conduct.
- Allow for a range of member roles.
- Allow for and facilitate subgroups.
- Allow members to resolve their own disputes.

These basic steps can be both stages in the formation of the community, and aspects of learning in themselves, as they involve the development and application of certain social skills. Apart from the formal learning communities, Palloff and Pratt advise to also allow for informal communities to form in separate discussion areas, and to give students their own homepage by way of introduction.

AutoUni has chosen a distinct type of learning community: the transdisciplinary team, “...as virtually no problems nowadays or in the foreseeable future fit into the structure of any one discipline; they can only be solved reliably by access to a number of different stocks of knowledge and disciplines.” (www.autouni.de/english/philosophie.html). By choosing this approach, AutoUni already addresses one of the major reasons for knowledge to “stick” and not be applied: the impenetrable divisions within organizations (Brown and Duguid, 2002). AutoUni also intends to have students talk about what is supposed to be most relevant for students from other disciplines/departments, to make them understand each other’s language and agree on a common language, thus strengthening the transdisciplinary community.

If the relations built in such a learning community are perceived as useful and retained in the students’ work environment, knowledge will continue to be shared. Adding students’ homepages and informal discussion areas may strengthen this process, as they will allow students to gather by their own choice, and to make connections throughout the community on a more personal level.

Modes of knowledge creation

Nonaka (1994, p. 19) describes four modes of knowledge creation, that could form a framework for addressing the integration of learning at AutoUni and knowledge management at Volkswagen. They are, in rearranged order:

- Combination (from explicit knowledge to explicit knowledge)
- Externalization (from tacit knowledge to explicit knowledge)
- Internalization (from explicit knowledge to tacit knowledge)
- Socialization (from tacit knowledge to tacit knowledge)

Combination

This mode describes the most tangible type of knowledge creation: the combination and exchange of explicit knowledge held by individuals. As it deals with explicit knowledge only, by nature the “exchangeable type”, it is not hard to imagine how this type of knowledge creation can take place in a learning community, especially a transdisciplinary one, in which the knowledge “held” by the members will generally not overlap significantly. What we can think of here are questions and answers concerning “facts” in a certain field of knowledge, one student explaining something to fellow students, the exchange of information in the form of articles, databases etc. This will enable the other students to access this knowledge when required. They may only do so, however, when it is relevant in their working situation. Although this mode of knowledge creation seems to be the easiest one, it may also prove to be the most superficial one. Nevertheless, it can be beneficial if students will know how to locate certain sources of knowledge outside their own department.

Within the company, students can be asked to make presentations to their colleagues about new explicit knowledge (sources) which they find particularly relevant for their own department. In such a way, awareness and access will be spread beyond the student community.

Externalization

Asynchronous conferencing, as defined above, is a great tool for making tacit knowledge explicit. Often, people do not know what they know. Questions from fellow students who may not “possess” the same knowledge will prompt them to recognize their own tacit knowledge and make it explicit. The additional benefit of asynchronous conferencing, the opportunity for analysis and reflection, makes it a good medium for this mode of knowledge creation. Students will become aware of different approaches to the same type of problem, they will come to understand why something that is unproblematic from their point of view may pose a problem in another department.

These first two types of knowledge creation do not need to pose a problem for knowledge management. Once knowledge is made explicit, it is available for storing, sharing, accessing etc. by whichever means available. However, within the learning community, students need to be made aware of the relevance of this type of knowledge for their own working situation. This is a shared responsibility of the individual students, the community as a whole and the instructor. The fact that real-life cases are used as a basis for study will contribute to this awareness.

Internalization

It is with this mode of knowledge creation that learning at AutoUni will benefit more directly the work environment of the student. Even though internalization may take place within the learning environment, where acquired knowledge will be applied to real-life cases, true progress will be achieved once the student starts to apply this knowledge in his or her own work environment. Therefore, students need to be stimulated to do so, for example by requesting them to “submit” cases from their own practice to the learning community, and to report on their way of dealing with them. Gradually, the student will get used to applying certain types of knowledge or skills acquired in the learning environment, in their everyday work, without making a conscious effort to retrieve the knowledge involved. Constant interaction between the work environment and the learning environment should be built into the learning experience to make sure this transfer does take place. Inviting “visiting experts” from within or outside the company will be another useful source of further expertise acquisition.

Both externalization and internalization could be promoted outside the AutoUni by having the students exchange jobs or become a trainee in a fellow student’s department. That way, the students will

encounter more directly the issues identified in the learning environment and be in a position to put into practice what they have learned and to exchange best practices from their own departments.

Socialization

This type of knowledge creation seems to be the most elusive. It refers most of all to the “apprenticeship-model” of learning: an apprentice gleaning the necessary skills by observing and imitating a master. It is here that Computer Mediated Conferencing may well fall short, as well as a strictly transdisciplinary approach, and where the importance of interaction with the workplace is greatest. Brown and Duguid (2002) describe the functioning of (uni-disciplinary) communities of practice, in which people learn from each other by working together, but also by seeking each other out outside work to discuss work related issues. As a whole, this community builds new knowledge, both tacit and explicit, building on the experience of its separate members. Apart from interaction with the workplace, here lies an important function for the face-to-face venues that form part of AutoUni’s educational program.

The students of AutoUni will be part of communities of practice in their workplace. They will have colleagues with comparable tasks. Being given the opportunity to study at AutoUni, these students can be made responsible for allowing their less privileged colleagues to glean their new skills, for example by giving them responsibility for trainees. Also, they can be asked to formally facilitate one or more communities of practice, to stimulate collaboration and knowledge exchange within their own department.

The Justification of Knowledge

“While organizational knowledge creation is a continuous process with no ultimate end, an organization needs to converge this process at some point in order to accelerate the sharing of created knowledge beyond the boundary of the organization for further knowledge creation.” (Nonaka, 1994, p. 26). In order for knowledge to become a tangible part of an organization’s knowledge base, it needs to be made explicit, put on record, stored and made accessible. However, by far not all knowledge created will have future value for the organization. It needs to be selected according to certain standards. Nonaka ascribes this task of determining the evaluation or justification standards to top or middle management (ibid.). Brown and Duguid (2002), however, warn against filtering “from a top-down, process perspective” (p. 112). Instead, they suggest a procedure of peer review.

It is here that I believe the major contribution of the AutoUni to Volkswagen’s knowledge management can be made. By bringing their working experiences to the learning and their learning experiences to the workplace, by working on real-life cases, by creating and applying new knowledge in collaboration with students from various disciplines, the AutoUni students are in fact constantly “on top” of the company’s living knowledge base. They are in a position to judge the relevance of new and old knowledge, and the evaluation and fixation of this knowledge can be made a part of their learning experience. I would therefore propose to make AutoUni students part of the procedure of knowledge selection and justification. Their involvement and responsibility will also serve to ensure that they will continue using this knowledge base in practice and stimulate others to do so.

Rosenberg (2001, p. 108) sums up the various roles that need to be fulfilled in an organization’s knowledge management effort:

- Information Architect
- Editorial and Publishing
- Online KM Librarian
- Knowledge Owner
- Content Contributor/Author
- Community Facilitator

Especially the latter three appear to be appropriate roles for AutoUni's students, as well as some functions in the Editorial and Publishing field. They will need to co-operate with the company's knowledge management experts, both adding to their own learning and to the company's knowledge.

Conclusion

Generating or creating knowledge is a major part of knowledge management, which should not be regarded as dealing merely with documented knowledge. As the AutoUni, according to its website, was conceived particularly for the purpose of generating useful knowledge for its founding company, Volkswagen, boundaries between the two should be made "permeable". The educational process should consciously be designed in such a way, that knowledge can flow freely between the two organizations. AutoUni's educational philosophy supports this effort.

Several recommendations can be made to ensure the exchange of information between the learning and the working environment. A main factor in making the AutoUni the "driving force" behind Volkswagen's knowledge management, will be to include its students in the formal procedures surrounding this effort.

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Author:

Gertrude Dudink MA
MDE Student
Charkow Beheer B.V./ESCC, Product Development
Graafseweg 274, 6532 ZV Nijmegen, The Netherlands
gmdudink@planet.nl

THE RIGHT TOOL FOR THE RIGHT JOB: AN EVALUATION OF COLLABORATIVE LEARNING VIA COMPUTER MEDIATED COMMUNICATIONS IN DISTANCE EDUCATION

Brian F. Fox, Santa Fe Community College

Collaborative Learning – Is it Worth the Bother?

Collaboration has been defined as any activity “... in which two or more people work together to create meaning, explore a topic, or improve skills” [1]. The pedagogical arguments and support for collaborative learning have certainly grown in recent years, with both the public and private sectors paying increasing attention to the concept. Not all agree, however, that this practice need be included or strived towards; Hülsmann [2] reminds us that some educators remain skeptical about its value, while Laurillard [3] writes that “... one of the great untested assumptions of current educational practice is that students learn through discussion” (p. 171).

In spite of a certain degree of scepticism, a belief in the effectiveness of collaborative learning is clearly evident throughout much of the literature dealing with education and training. For example, Harasim [4] states that “Collaboration is among the most effective approaches to cognitive and social learning ... Writing skills are improved, through writing to real audiences ... [and it] introduces multiple perspectives on an issue or topic” (p. 207), while Clark [5] argues that “There is ample evidence from traditional classroom environments, non-traditional FTF environments, and OLEs [online learning environments] to indicate that collaboration can enhance learning.” In agreement with the stated goals of AutoUni, Jarvis [6] adds that learning is both a social and a personal phenomenon, and that the sharing of multiple perspectives tends to increase the knowledge learned and the satisfaction derived from the process. In reference to the UMUC/University of Oldenburg’s Master of Distance Education program, Brindley, Zawacki, and Roberts [7] conclude that “... the interactive collaborative model is the right one for masters-level graduate study. It supports reflective discussion, Socratic dialogue and informal social networking” (p. 160). AutoUni, as described in the call for papers for this workshop [8], states that it believes that the vast majority of innovative ideas today are the results of trans-disciplinary research and development and intends to emphasize collaborative learning and knowledge building through teamwork. For these and other reasons, collaborative learning should be considered an integral component in all learning environments.

Can Collaborative Learning Be Successfully Achieved Online?

While most research on computer mediated communications (CMC) has been positive about its potential and capacity to support collaborative learning, McLoughlin and Luca [9] argue that few empirical studies have actually made recommendations about pedagogy to practitioners in higher education. In a study they conducted, the researchers found little evidence of higher order cognition among students’ forum messages. Many authors, though, have reported success in achieving collaborative learning through CMC. Goldenberg [10] lists collaboration as an aid to education and finds that collaborative groups often lead to virtual learning communities and the formation of skills that would be useful for collaborative efforts in the post-educational world. Turoff [11] states that students in an OLE are receiving a significantly better education than face-to-face (FTF), noting that the quality of discussions was notably increased. Warschauer [12] describes the importance of online collaboration in a study of foreign language instruction, where students, through asynchronous CMC, collaborated in ways not possible in verbal conversations. Curtis and Lawson [13] report that their analysis of students’ contributions to online discussions provides evidence of effective collaboration in this online environment, and Clark [14] simply concludes that there are many examples of collaboration being used to improve learning, participation and satisfaction. Additionally, Holmberg

[15] adds the following: “Peer-group interaction between students is of great value and is more effectively promoted in distance education by online communication than in any other way” (p. 134).

A Brief Review of the Strengths and Weaknesses of Collaborative CMC Tools

In analyzing the uses of CMC for collaborative learning, it is helpful to first categorize these technologies into the broad groupings of asynchronous and synchronous. While not complete, the following provides a brief overview of many of the more widely used CMC tools.

Asynchronous CMC Tools

McCormack and Jones [16] provide educators with a concise list of asynchronous CMC strengths: geographic and temporal independence (“anytime/anywhere”), absence of physical cues, silent participation (also known as “witness learning” [17]), computer mediation, and interactivity (pp. 199-200). To this list might be added low bandwidth needs, moderate computer hardware and software requirements, democratic participation opportunities, and more time for reflection and processing of course materials and dialogue with instructors and students. McCormack and Jones also offer a list of weaknesses: absence of physical cues, training needs, imperfect technology, reading online, access, asynchronous communication problems, increased interaction that may place increased burdens on both instructors and students, and moderation issues (pp. 200-201). Other potential shortcomings include a lack of spontaneous dialogue, transactional distance issues, and increased literacy requirements. Of the many forms of CMC, asynchronous forms are still the most commonly utilized and the more thoroughly researched. The most popular forms are email and conferencing.

Email

Clark [14] describes email as one of the oldest and most powerful collaboration tools. Beaudin [18] states that email allows students to easily work in pairs or small groups and that the asynchronous nature of e-mail makes it more suitable for complex writing and problem-solving tasks than might be accomplished via synchronous discussion in a class. Clark adds that email is usually available in every OLE and that most online students have one or more email accounts. Dringhus and Terrell [19], however, observe that a disadvantage to email is its lack of organization and the likelihood of information overload occurring when multiple topics or large groups are involved. Clark concludes, “In spite of its limitations, e-mail is an excellent choice for communicating private information and short collaborative projects involving small group sizes.”

Conferences/Discussion Boards

Clark [14] declares that the public conference is an excellent collaborative tool for instructor-student/student-student collaboration, while Dringhus and Terrell [19] describe it as a stored transcript of a discussion by a group in easily accessible format. As may be found in many OLEs, conferencing allows discussions to be organized by topic (threading), and many systems support tracking in terms of what messages have been previously read by participants, allowing for postings to be sorted between those that have been read and those that have not, or simply by thread, in order to help avoid information overload. Clark and others have argued that the material on a public conference has a tendency to be more thought out than verbalized material due to the fact that both a student's peers and his or her instructor can read them and due to their “permanent” nature. Hülsmann [2] identifies two main areas of strength for this form of CMC: all have equal access to posting their thoughts), and structure through the use of threading, which provides anchorage and focus. Among the weaknesses cited he includes “white noise” (due to the fact that all can speak at the same time), the problem of volume in busy conferences, and anxiety over the need to be visible through one's postings.

Listservs

These asynchronous CMC services allow individuals to send and receive email messages automatically to and from a mailing list, which may be moderated (messages are approved before

distribution) or unmoderated (messages are freely distributed). While the basic user-interface is that of email, the command structure required to interact with the listserv is somewhat more complicated. Listservs possess a variety of strengths including the ability to interact directly or vicariously with a diverse community of learners and practitioners, and instructors can post questions to the listserv in order to elicit comments from the community as a whole, thereby providing more diversity to the learning experience. Weaknesses might include less familiarity in general with the interface and the uncertainty of response regarding a given topic. Listservs, while still widely utilized by academic and professional communities, are not used as frequently as conferencing in contemporary OLEs.

Document Sharing

Clark [5] describes the capabilities of document sharing as a great aid to collaboration. Document sharing allows an author to share a word processing document with others, with the word processing application tracking the changes as well as who made them; as changes are made they can be accepted or rejected, all the while retaining the original text. The group could then view all the proposed changes, select or reject them, and then decide upon the final version. Many up-to-date word processing applications support these features, and this has been done to some degree in public conferences that allow multiple authors and editors. Document sharing is generally utilized in conjunction with conferencing and/or email due to its limited ability to support communications.

Synchronous CMC Tools

Curtis and Lawson [13], among others, state that the current forms of synchronous CMC are effectively limited by the capacity of the communication links now available and that only the exchange of text (chat) is readily accessible and reliable. While this may be true to a degree, there are many examples of the successful use of synchronous CMC, and interest is certainly growing as the applications evolve and proliferate. With regard to transactional distance [20], it could be argued that synchronous DE offers participants a greater sense of presence for both others and themselves. Synchronous DE by its definition also requires simultaneously being present in the virtual space, creating a higher level of structure for students, many of whom prefer and/or need it.

Palloff and Pratt [21] state that their preference is for asynchronous environments: “The challenge of conducting a synchronous meeting or seminar is to coordinate time with a dispersed group and to facilitate in such a way that all ‘voices’ are heard” (p. 47). While the authors agree that a synchronous environment can be dynamic and challenging and is especially useful in facilitating brainstorming and whiteboarding sessions, for it to be successful they argue that the number of participants should be small, the concerns and time zones of all participants must be considered, and guidelines for equal participation must be established in advance. Though synchronous CMC violates the concept of “anywhere/anytime,” many educators and students argue for its value, despite the difficulties of fitting such sessions around work, social commitments, and across time zones [13]. Duckworth [22], for example, argues, “Live e-learning creates a new dimension for knowledge, with incredible instructional versatility. Although instructional design for live e-learning can be more complex than traditional ISD, designers will discover powerful, multimedia resources to meet the increasing demands of professionals racing for knowledge acquisition.” The convergence of telephony, videoconferencing, and computing accompanied by increases in communication bandwidth is enabling real-time voice communication (using applications like NetMeeting [23] and Yahoo! Messenger [24]) with document sharing and whiteboards, the beginnings of fully integrated desktop videoconferencing. Curtis and Lawson [13] argue for more research to examine the need for and relationship between asynchronous and real-time interactions, a theme echoed by many researchers.

In terms of general recommendations, Duckworth [22] offers several suggestions for synchronous learning classrooms. Sessions should be limited to no more than 90 minutes (and preferably less), with participants being provided practice opportunities with which to explore the technologies being utilized. Because many of these tools are new to students, instructors should confirm the technical expertise of participants, providing students with support or referring them to it as appropriate. Class sizes should be limited to no more than 12 to 15 students in order to enhance interaction, encourage group collaboration, and create a forum for shared experiences.

Chat

Chat offers a variety of benefits to both DE students and instructors. As a synchronous example of CMC, it allows both real-time communications between participants, enabling more dynamic conversations to occur than are possible via asynchronous CMC, and often transcripts. Chat requires little bandwidth and is fairly simple to use, even for beginners. Dialogue is democratic in chat rooms; anyone can post messages or replies as he or she chooses, and without visual cues such as gender, age, race, etc., participants are somewhat freed from the possible impact of these factors.

Chat also possesses weaknesses, of course. Frequently relying solely on text (some forms of chat do support audio and video to varying degrees), poor typists are at a distinct disadvantage, and without the ability to see other participants, body language is completely lost, increasing the chances for miscommunication. Because of the free-flowing form of most chat sessions, chat participants are often talking over one another, frequently resulting in a hodge-podge of disconnected statements and replies that can create confusion in a busy chat room. “Flooding” (excessively long posts) is also a problem reported by many users of chat.

Hülsmann [2] describes this phenomenon, and in comparing conferencing to chat he states, “... rather than sharing the linear structure of the face-to-face debate, which is characterized by ‘turn-taking’ it [conferencing] generates discussion clusters or threads. However, chat transcripts are linear since the software for chat does not support threading. This means that chat generates all the managerial problems of asynchronous discussion without providing the software support to manage them” (p. 98). A possible solution to this is to select a moderator and impose structure and guidelines on the chat session; for example, Kurtz [25] suggests selecting or designating someone to serve as the discussion moderator (perhaps taking turns), declaring a topic for the discussion (in advance if possible), with participants being recognized by the moderator by their typing a “!” and not posting until called upon. While it might be argued that this reduces the democracy of free-flowing chat sessions, it does serve to focus the discussion more and greatly helps to organize the dialogue.

Instant Messaging

Instant messaging, such as that found in ICQ [26] and Yahoo! Messenger [24], provides one-to-one and one-to-many chat capabilities, with some services (such as Yahoo! Messenger) including audio and video streaming capabilities. These services enable individuals to detect if “buddies” are online or not (presence awareness) and then to request a chat with one or more of them. Some features found with instant messaging programs include file sharing and group browsing. These services are generally free and require modest downloads to set up, and a growing number of students are both familiar with and comfortable using them. A drawback, however, is that to date they are not interoperable, with members of one service unable to contact members of rival services. While some applications have achieved limited success with interoperability (e.g. Trillian [27] and Gaim [28]), connection is often short-lived, and the legalities of doing so have been challenged. Until such time as interoperability becomes a reality, instant messaging will remain segmented between services.

Whiteboards

White boards, such as that provided by Groove [29], allow participants to simultaneously share a drawing and writing space. These services are frequently employed when participants wish to develop diagrams, flow charts, mathematical procedures, and other relatively uncomplicated graphics. Whiteboards are rarely used as stand-alone CMC tools and are commonly part of a suite of tools, such as can be found in Microsoft’s NetMeeting [23], in order to better support discussion.

Streaming Audio/Video

Growing in popularity are CMC tools that incorporate streaming audio and/or video. These technologies enable participants to transmit real-time voice and video via the Internet, with varying levels of quality depending upon the application’s capabilities, bandwidth available, Internet congestion, and receiving client’s hardware and software capabilities. While audio can be transmitted successfully at relatively low bandwidths, video, especially high-quality, requires much higher levels,

particularly if multiple streams are being transmitted. While some researchers have suggested that low-quality video (which possesses a reduced frame rate, enabling the observer to see “jerky” movement) has little or no effect on an audience, others disagree. Orton [30] describes the problem of audio-video asynchrony, where sound is slightly out of synch with the accompanying video. Research conducted at Stanford University found that audio-video asynchrony results in diminished evaluations of the speaker and the content being spoken; furthermore, in those cases where the participants did not consciously register the problems when they existed, they still evaluated the presentations more negatively. It is theorized that audio-video mismatches are fundamentally unnatural to human beings, regardless of whether or not it occurs via media or elsewhere. Orton goes on to state that IBM avoids this problem by using a still picture of the presenter along with the audio track, relying on the audio to convey nuance or subtlety. He adds that IBM has discovered that a still photo accompanied by self-paced text is preferable for those users for whom English is not their first language.

MUDs, MOOs, and 3D Virtual Reality

MUDs and MOOs offer users the opportunity to interact with and in some cases alter text-based virtual environments online, with educational MOOs, such as TAPPED IN [31], being developed that include internal email, documents, blackboards, classrooms, etc. [32]. In order to interact with these online communities, participants create virtual representations of themselves known as “avatars.” Originally and still frequently utilized for socializing and entertainment, MUDs and MOOs have been and are being used for educational purposes. While these technologies have many proponents, they have successfully been used as such only to a limited degree, in spite of their long-time availability, low bandwidth, and modest technology requirements. Two reasons offered for this include overall learning “inefficiency” for busy adult learners (complicated commands are often required) and extensive production time and expenses for programming and development.

A more technologically advanced version of these virtual environments may be found in 3D Internet communities. Cybertown [33] is one such example; while it is used solely for entertainment and social purposes, it illustrates some of the capabilities of these technologies, where participants through the character of their avatar wander through a variety of environments, interacting with both human and non-human virtual beings and objects. The potential for such technologies has not been lost on many researchers, who foresee virtual tours through distant lands and cities, space travel, museums, historical tours, etc. The drawbacks, however, are increased requirements for bandwidth, technology, training, and labor and production costs. Students, however, are increasingly gaining access to and experience with these powerful technologies. Additionally, production costs might also become less problematic by the mass-marketing of these services to increase ROI, in a manner akin to what we now see with a growing number of successful 3D online roleplaying games.

Convergence of Synchronous CMC Tools

In recent years we have seen a convergence of many of these synchronous tools into single services and/or their incorporation into CMS/LMSs. Services such as those provided by Horizon Live [34] include chat, streaming audio and voice over IP (VOIP), whiteboards, real-time surveys and quizzing, group browsing, slide shows (often utilizing PowerPoint), etc., and these can be run independently or incorporated within WebCT. While some services require software downloads and installations, others are capable of running solely through the user’s browser in conjunction with plug-ins (e.g. Quicktime, Shockwave, and Flash). An up-to-date Java Runtime Environment/Virtual Machine is often required, with varying amounts of bandwidth needed as well. Applications such as NetMeeting [23] have been successfully employed [35] for educational purposes and training, as have many other similar services (such as Horizon Live) [30].

Further Factors for Consideration

In addition to factors unique to these various technologies, other issues must be addressed that are relevant to synchronous CMC tools and DE collaborative learning in general. As mentioned above, many authors have pointed out that these technologies are frequently new to participants and require

higher levels of training and support, including perhaps introductory sessions [22]. Additionally, Diaz and Carnal [36] found that DE students, in terms of their preferred learning styles, were significantly more independent and less collaborative learners, while Beaudoin [17] reminds us of the prevalence of and frequent preference for witness learning. Furthermore, Swan et al. [37] found that the greater the percentage of the course grade that was based on cooperative or group work, the less students thought they learned from the course. As a result, instructors wishing to incorporate collaborative learning must take measures to ensure that students are properly prepared and motivated [13, 36, 38]. Along these lines, Diaz and Carnal's study did reveal that online students were willing and able to embrace collaborative teaching styles if the instructor made it clear that this was expected and gave them form and guidance for meeting this expectation.

The issues of gender and culture must also be considered. Gunn et al. [39] remind us that gender does indeed appear to matter in CMC, and that the levels and types of support provided learners must be adjusted accordingly. The authors suggest, for example, that good moderation in a discussion forum can help to ensure equal participation and that while educational games and challenges may be more appealing to a typically competitive male orientation, communicative and collaborative activities may appeal more to typical female traits. Cultural and cross-cultural issues must also be taken into account; if a class is composed of students possessing varying cultural norms and learning preferences, these may complicate or facilitate collaborative activities [40]. The danger here, of course, is that we may run the risk of stereotyping our students.

Conclusions

With regards to the selection of technologies, Bates [41] offers his ACTIONS model (access, cost, teaching and learning, interactivity and user-friendliness, organization, novelty, and speed) to assist course developers in their choice of media. While the selection of CMC technologies for synchronous and collaborative learning requires a great many considerations, several educators provide guiding principles to bear in mind. Bates [42] reminds us that "technology is, by definition, a means to an end, not an end in itself" (p. 45), a sentiment echoed by Holmberg [43] who adds, "It is not our task to propagate technology but to help students to learn." Cutting across all forms of media, Moore and Kearsley [44] offer the following sage advice: "... what matters eventually is not so much what media are employed, but how they are actually used" (p. 98).

While there are no simple answers regarding the selection of technologies, this author, as both a college educator and graduate of the UMUC/University of Oldenburg's Master of Distance Education program, has observed several patterns in their use. First, students seek the familiar: email, discussion boards, and to a lesser degree chat and instant messaging. Second, students tend to prefer technologies that are relatively simple and reliable; if asked to use more advanced systems, such as synchronous CMC suites with VOIP, the probability of technical difficulties rises greatly, resulting in almost certain frustration and dissatisfaction on the part of affected students. Third, it might be argued that the majority of DE students prefer asynchronous technologies as a rule due to their increased flexibility and the greater control of the learning environment they provide. This, however, does not mean that instructional designers should ignore the desire on the part of many students for frequent synchronous communication, a desire shared by most students at some point. Along these lines, Downes [45] proposes that instructional designers strive towards "asynchronous synchronous learning." While instruction and collaboration between students would be conducted primarily through asynchronous methods, synchronous technologies, such as chat or IM, would be used optionally by both instructors and students in the form of online office hours, formal and informal discussions between instructors and students, and study and work sessions between students. In this fashion, the complementary strengths of these technologies and media are more effectively exploited.

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Author:

Brian F. Fox
MDE Student
Santa Fe Community College, Business Programs
3000 NW 83rd St, A-229, Gainesville, FL 32606
brian.fox@sfcc.edu

ONLINE COMMUNICATION DYNAMICS AND PARTICIPATION STYLE

Cindy Schuster, University of Baltimore

Introduction

One of the main opportunities and at the same time a challenge in web-based education is for the instructor to assess, develop and encourage student participation. Although many online instructors profess to value, and attempt to evaluate online participation through a variety of means, there is no established body of knowledge on the various forms such participation may take, or how it should be determined. Assessment and measurement of participation is already difficult in a face-to-face setting and it becomes more complicated in web-based learning. Building the dynamics to sustain a good interaction level in a web-based classroom takes creative innovation of instructional design to build the components of content within the technology and communication channel. It also takes an instructor moving interchangeably between the roles of subject matter expert, facilitator, and community builder (Schuster & Bento, 2003).

Growth in distance education has not been accompanied by an equivalent growth in the understanding of its pedagogical implications (Gallini, 2001; Shedletsky & Aitken, 2001). This disparity is particularly glaring in terms of fully exploring the interactive potential of one special form of DE, web-based education. As we move from the set expectations of traditional face-to-face classrooms to flexible or blended learning opportunities, the challenge of understanding and nurturing participation becomes even greater. This paper proposes a classification of student participation and learning style in online class discussions and how it can be applied to the Volkswagen AutoUni "Knowledge Lead" philosophy.

Learning Outcome Models and Interaction Types

One approach to classifying distance training and education can be summarized from two learning models: transmission and transformation (Berge 1999; Berge, 2001). In the *Transmission* model, "content and knowledge determined by someone else is *transmitted* to the learner (Berge, 1999 p. 19). In this instructor-centered approach, the instructor selects the content and the teaching methods that will best "program" preconceived knowledge to the passive students, from whom a specific outcome is expected. Recent research on education and cognition has been increasingly critical of the Transmission paradigm (Kemery, 2000), supporting instead the other major paradigm, Transformation.

In the *Transformation* model, "a learner *transforms* information, generates hypotheses, and makes decisions about the knowledge he or she is constructing or socially constructing through interpersonal communication with others." (Berge, 1999, p. 19). The model focuses on the activities of the learners, and how they actively participate in the construction of knowledge. In this learner-centered approach, students develop personal ways of framing problems within the concept for an individual unique learning outcome. In this transformation context, student participation is not just a form of testing whether knowledge was transmitted. The social interactions and synergies of the community of learners are integral to the individual learning process (Schuster & Bento, 2003).

The Transformation model and its emphasis on interaction have profoundly influenced distance education. Moore believes that in order for us to better understand and practice the concept of interaction, we should distinguish three basic types of interaction that must take place in distance education: Learner-Content, Learner-Instructor and Learner-Learner interaction (Moore, 1989, 1996).

- Learner-Content interaction has long been the touchstone of education. Regardless of the level of sophistication in the presentation of content itself, it is only when the student interacts with that content and incorporates it into a personal cognitive structure that learning actually takes place.
- This learning is further reinforced through Moore's second type of interaction, Learner-Instructor, which involves activities such as seeking and offering explanations, analogies and examples, and elaborating, discussing and applying content.
- According to Moore, distance educators often content themselves with helping students achieve those two classic types of interaction, Learner-Content and Learner-Instructor. But for distance education to move beyond the Transmission model and be truly transformative, a third type of interaction is essential: Learner-Learner. This interaction among learners can take place with students relating directly with each other or in-group settings, with or without the instructor being present in real-time (Schuster & Bento, 2003).

Content and Interpersonal Interaction

In spite of the potential convenience of asynchronous communication, in terms of allowing students to interact with each other and with the instructor when and where they want, and even to control the pacing of instruction (Berge, 1998), asynchronicity is sometimes a double-edged sword (Kemery, 2000). Without the direct stimulation of real-time interaction, some students may decrease the frequency and quality of their participation. Online instructors often react to this by increasing the percentage of the grade that is tied to participation in the discussion boards. The problem, however, is that even those types of reward and punishment approaches may not work, if they do not reflect a real understanding of what is "good" or "bad" participation, and the factors that contribute to either (Schuster & Bento, 2003).

In order to gain a deeper understanding of participation, its causes and consequences, we need to develop a classification of the types of behavior involved. The proposed taxonomy is based on Moore's (1989, 1996) discussion of types of interaction in distance education, as summarized by Berge (1998).

As represented in Figure I, the taxonomy plots different types of participation into four quadrants, determined by a horizontal axis that corresponds to Berge's "Interaction with Content" (and Moore's Learner-Content Interaction), and a vertical axis that corresponds to Berge's "Interpersonal Interaction" (a combination of Moore's "Learner-Instructor" and "Learner-Learner" Interactions).

Figure I - Classification of Participation in Online Courses

	QUADRANT III	QUADRANT IV
Interpersonal Interaction HIGH	"Social Participants"	"Active Learners"

Interpersonal Interaction LOW	QUADRANT I "Missing in Action"	QUADRANT II "Witness Learners"
	Interaction with Content LOW	Interaction with Content HIGH

The two bottom quadrants (I, II) share the characteristic of low interpersonal interaction. These are the "invisible" students, the "lurkers" who do not actively participate in the online discussions. They are often labeled into a single category of "non-participants." What Figure I reveals, however, is that there can be two very different dynamics going on behind the same pretext of "invisibility."

The lurkers in Quadrant I represent the kind of non-participation that we call "Missing in Action," low in both Interpersonal and Content Interactions, as vividly portrayed in this vignette:

"Hsu (1992) reports that the 'CEO' of one of the online simulated organizations in his Virtual Management Laboratory simply disappeared. The other group members posted a 'missing persons report' and conducted a humorous 'detective game' to find him. The peer pressure, delivered in a humorous rather than insulting manner, eventually induced the missing leader to return to his online 'company,' and it subsequently performed very well." (Harasim et al, 1995, p. 209)

This type of lack of participation is not often dealt with in this humorous way, and it doesn't often have such a happy ending. It can ultimately result in no learning, a disastrous grade, the student quitting the course, or a breakdown of the virtual classroom community (Schuster & Bento, 2003),

Although the lurkers in Quadrant II may seem equally "invisible," their dynamic is entirely different. These are the "witness learners," who are actively engaged with the course materials and discussions (high Content Interaction), log in frequently and do all the readings, but do not actively contribute to the online discourse (low Interpersonal Interaction). Helmut Fritsch, director of the Center for Research in Distance Education at FernUniversitaet (Germany), proposed the term "witness learners" to characterize students who, while not contributing written entries, are still engaged in the learning process by observing (witnessing) the written exchanges of their peers as an online seminar progresses. Fritsch argues that learning is still taking place, albeit in a more passive and less visible way (1997).

A study of "invisible" students in an online graduate course (Beaudoin, 2002) highlights the importance of not lumping together "witness learners" with their more infamous companions in invisibility, the "missing in action" lurkers. Beaudoin found out that "witness learners" are indeed learning, and can perform even better in graded assignments than students with average visibility, although not as well as those with high visibility. This should not be interpreted as a blanket endorsement of all forms of low visibility, but it does formulate that interaction with content might be obtained without interpersonal activity.

Just as all low visible participation is not equally bad (Quadrants I, II), not all highly visible participation is equally good (Quadrants III, IV). Quadrants III and IV both share the characteristic of high Interpersonal Interaction. These are highly visible students, who often participate in the online

discussions. An analysis of the kind of contributions they bring to the discussion reveals that they differ fundamentally in terms of their Content Interaction.

Students in Quadrant III (High Interpersonal Interaction, Low Content Interaction) thrive in the social aspect of the online discussions. "Social Participants" are great conversationalists, with high communication and interpersonal skills. The problem is that their interest in the social aspect of the online interactions may actually happen at the expense of reflection and thoughtful consideration of course content. The importance of instructors differentiating and detecting high and low content interaction in the case of students with high interpersonal interaction is that instructors can explain and help the "social participants" correct the limitations in their style of participation (Schuster & Bento, 2003).

Students in Quadrant IV ("Active Learners") represent what online instructors truly mean when they talk about "good participation." These students are high on both Content Interaction and Interpersonal Interaction. Their contributions to online discussions are both substantive and frequent. As discussed in the literature on teams (Kemery, 2000; McShane & Von Glinow, 2000; Whetten & Cameron, 1998), they contribute not only to the task itself, but also to building and sustaining relationships in the learning community.

Whetten and Cameron (1998, pp. 433 and 434) provide an excellent description of the behaviors necessary for task facilitating (direction giving, information seeking, information giving, elaborating, coordinating, monitoring, process analyzing, reality testing, enforcing, summarizing) and for relationship building (supporting, harmonizing, tension relieving, confronting, energizing, developing, facilitating, processing). Some "Active Learners" may specialize in some of these roles, or may take them on as necessary. The critical point is "to ensure that these roles are fulfilled, so that the team can function effectively." (McShane & Von Glinow, p. 284). Another important implication is that for students to be effective in their online contributions, they have to be truly prepared not only in terms of technological, but also behavioral skills (Kemery, 2000, pp. 230-231).

"Knowledge is the Key" AutoUni Participation

Understanding the dynamics of individual interaction style and its impact on classroom community and environment can be helpful to AutoUni in applying its principles of its' "Knowledge is the Key" concept (Volkswagen AutoUni, 2004).

- "Bridge function" - Developing student's ability to apply theory to actual practice and then innovate through collaboration requires interaction ability. By broadly characterizing participation styles, an instructor can apply several learning methods and styles to result in better utilization of each individual student to the whole of the group.
- "Transdisciplinarity" - With a multidiscipline approach, AutoUni can motivate and train students to apply their talents where they can make the team excel. The opportunity for learner- learner interaction to occur where each student can be appointed as facilitator or team leader in content areas where they are expert increases the development and success of learner-centered learning and transformation.
- "Personality and competence development" - Facilitating student growth to and settlement in the Active Learner Quadrant in the Classification of Participation taxonomy is the result of learner-centered learning and the building of the learning team that integrates function, technology and philosophy within reality and promotes knowledge learning.
- "Innovation organization" - Using the blended learning approach student ability to research and practice application of knowledge within and outside online learning technologies is ensured.
- "Real and regional didactics" - Actual problem case study and the offering of a mix of face-to-face and online learning opportunities allow students to apply learning knowledge to work situations in a variety of environments. Incorporating and tailoring content to "regional" differences through selective course packaging allows differentiation in content to meet the needs of a worldwide workforce and corporate philosophy.

- "Strategy forum" - This forum named "Think Tank" is in reality lifelong learning and a personal network alliance. If successful it creates a corporate spirit similar to what alumni associations create. Idea exchange, networking, and providing interaction when face-to-face interaction is unavailable.

Concluding Thoughts

There is growing evidence that increased participation (in quality and quantity) can increase learning, and that instructors can control a series of elements in course design and delivery that may result in increased participation (Harasim et al, 1995; Kemery, 2000). If instructors are able to move more students into Quadrant IV, and keep those who are there from sliding back into other Quadrants, the practical benefits for individual and collective learning can be significant (Schuster & Bento, 2003).

The implications for AutoUni in the taxonomy of participation are numerous. This proposed classification opens multiple areas of further investigation in terms of the various types of participation to meet the learning knowledge outcomes.

- How do variables such as course design, technology, characteristics and behaviors of both instructors and students (gender, age, personality, cognitive style, cultural and professional backgrounds, etc) affect the relative frequency of students in quadrants I, II, III and IV (Schuster & Bento, 2003)?
- How does the corporate culture effect participation on dependent variables such as: completion and satisfaction with the course and loyalty?

AutoUni continues to develop innovative and effective learning methods that stimulate participation and team development in online courses. In doing so, AutoUni may find learning how to improve course participation may in turn influence, in the longer run, their ability to more effectively guide students to successfully participate in virtual and face-to-face teams in the workplace. What is being realized is that web-based instructors and students do not have to strive to duplicate or feel in competition with the communication style of face-to-face learning. Instead "communal scaffolding" (cf. Kim, 1998) is seamlessly developed to bridge the gap between the cognitive and interpersonal requirements of online learning (Woods et. al., 2003) to create the desired learning outcomes.

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Author:

Cindy Schuster, MDE Student
University of Baltimore
1420 North Charles Street
Baltimore, MD 21201 USA
cschuster@ubalt.edu

PREPARING STUDENTS TO BE COLLABORATIVE LEARNERS IN DISTANCE LEARNING AND TRAINING AT VOLKSWAGEN AUTOUNI

Linda J. Smith

Introduction

Students entering a distance learning or training program are often expected to study in collaborative learning groups. The experience is supposed to contribute to the learning process and perhaps lead to building a community of practitioners within a profession. Learning providers might assume that such students are prepared for collaborative activities, particularly adult distance learners who work in a team-oriented professional environment. However, there are important differences between work teams and study groups, and while prior team training and experience may be helpful to the distance student, additional preparation is needed. Whether students are participating in class activities involving all learners or working in smaller study groups, the quality of their experience can be affected greatly by the collaborative learning skills all participants bring to the course. An instructor may be expected to provide a learning environment supportive of building a learning community, but teaching basic collaborative principles within every course detracts from the time and resources that should be devoted to delivering the primary subject matter.

In the context of Volkswagen (VW) AutoUni, there are unique advantages and challenges in the preparation of students to be collaborative learners. In the first phase AutoUni will focus on developing elite VW students in a transdisciplinary program that integrates business, science and social features and incorporates comprehensive personality and competency development. Advantages include the built-in commitment students have to company goals and the opportunity to select student learning groups based on a balance of existing knowledge and skills; challenges exist in finding ways to help students from different backgrounds and personal characteristics to bond together in a learning experience. With each successive phase of AutoUni, the advantages decrease and challenges increase as learning is offered to VW suppliers and contractual partners and then to the general public.

This paper examines the knowledge and skills students need to be successful collaborative learners and suggests an approach to preparing students in those areas at the beginning of their distance learning experience. Recommendations and suggestions are based on a review of research, experience in an online master degree program, and the results of a prototype course in developing collaborative learning skills delivered to a group of University of Maryland University College (UMUC) graduate students during Fall Term, 2002.

Some key characteristics of collaboration

Webster's Online Dictionary provides a starting point for defining collaboration. "Collaborate" means "to labor together, especially in an intellectual endeavour." Collaboration is collegial: "marked by power or authority vested equally in each of a number of colleagues." Leadership is important in collaborative learning, but there are no followers in the sense that a leader defines what others must do. In collaboration, there is a sharing of effort, yet the work is not merely a division of labor. In fact, division of labor is a concept that can be detrimental to learning outcomes if it means that learning activities (rather than the efforts to make learning available) are divided among individuals.

The student experience

When collaborative learning works well, it can greatly enhance learning outcomes and student satisfaction, but when it fails, it can reduce student performance and, in some cases, influence a

student to drop out of a course or learning program. The following two lists name some of the positive and negative experiences a student may encounter.

Positive

- Sense of belonging
- Supportive environment
- Diversity of ideas
- In-depth discussions
- Healthy debate
- Development of ongoing collegial relationships

Negative

- Sense of alienation or isolation
- Hostile environment
- Disrespect for differing opinions
- Off-topic discussions
- Divisive argument
- Poor performance on group projects, including unfair workload and lowered grades

Collaboration vs. division of labor

Division of labor may be efficient in the workplace, but it is not an effective way to collaborate in a learning environment. When students are asked to work together on a project, the instructor assumes that all students will learn something about the entire assignment. However, what can easily happen among students unfamiliar with collaborative learning concepts is that the work is divided with each group member working independently on his/her task. An editor then compiles individual contributions into a final product. While all members may be invited to examine others' work, they have limited basis for comment and no personal investment in acquiring knowledge beyond their own tasks. Individual contributions will lack the refinement and depth of understanding that results from group discussions of major issues, diversity of opinion, and consensus building for the final product.

The goal of collaborative learning

The division of labor approach violates the basic tenets of collaborative learning. Palloff and Pratt (1999) emphasize that interactions among students, as well as between faculty and students, are key to the learning process. They assert that successful learning outcomes are linked to "the formation of a learning community through which knowledge is imparted and meaning is co-created" (p. 5). Through collaboration, students explore subjects to reach a knowledge level rarely achieved by independent study.

Work teams compared to traditional collaborative learning groups

A comparison of work teams and traditional collaborative learning groups (CLGs) reveals some important differences between the two. Understanding these differences can help identify key factors affecting whether or not CLGs will be successful and students will be satisfied with the experience. Avoiding the negative aspects of the traditional CLG experience can help AutoUni improve collaborative learning. The comparison is summarized in Table 1.

Participants on work teams are selected because they have the combined requisite skills for a project, whereas selection for a CLG may be random from within the class. On average, random selection should result in most CLGs having an appropriate mix of abilities, but there can be groups whose members do not complement each other well. In the first phase of AutoUni, group selection will be

based on careful matching of disciplines and knowledge with group needs; however, in later phases, extra effort may be required to make appropriate groupings of students who are not VW employees. Many work teams have prior training. They are introduced to the phases of team formation, provided with guidelines for reaching consensus, and given opportunities to practice team skills. Traditional CLG participants' understanding of principles of collaborative learning is limited to what they are able to deduce from earlier class experiences.

Leadership on a work team may be determined by position within the organization, level of responsibility, and the prior experience of the individual selected. Leadership in a CLG may be randomly assigned or be determined by group election. It may also be shared collegially among the group, but leadership in some form must be exercised in order for group projects to be planned and executed. Leaders and other members of work teams often have the advantage of knowing one another from past associations in an organization, whereas CLG members may never have met prior to their course. Members unfamiliar with one another have no basis for the trust and mutual understanding that are important for supporting healthy discussion and debate of subject issues. Similarly, commitment to a team or group effort can affect outcomes. Work teams will be committed to the success of their effort based on their employment. However, CLG commitment to group work is based on individual student interest and perception of value, particularly where individuals do not know their fellow learners and have not bonded with them. Bonding may be easier in a work team setting where the duration of a team can last for years. CLGs usually have only a few days to a few weeks to bond and accomplish their objectives.

Another major difference between work teams and CLGs is that in a business environment, members know the subject matter, but in a CLG, members are just learning the subject. If a work team has problems with a member's lack of knowledge or performance, there are procedures to deal with the issue. CLGs have few established procedures to deal with performance problems among the members and may suffer from an inequality of workload or abilities. It has been suggested that more capable students benefit from teaching less able learners in their group because the teaching enhances their own understanding (Santo, 1998). But these students may feel that they are drawn away from exploring a subject in more depth because of the time required to tutor their fellows or to compensate for a lack of contributions from others; their level of satisfaction in a program can be diminished if they experience these limitations frequently. Satisfaction can also be affected by the evaluation of outcomes. Work team members are usually evaluated based on responsibilities. CLG members may be evaluated collectively with everyone in the group receiving the same grade, regardless of the level of effort of individuals. Higher performing members can be resentful if poor group performance lowers their grades for a course, especially if grades are important to an individual's objectives for the future.

Table 1. Comparison of Work Teams and Collaborative Learning Groups

	Work Teams	Collaborative Learning Groups
Selection	Selected for skills	Usually selected randomly
Training	Team training	Prior "training" unlikely
Leadership	Selected by position and responsibility	Selected randomly or by group election
Members	May be known from prior work	Often unknown prior to course
Commitment	Based on employment	Based on student interest and perception of value
Subject	Members know the subject	Members are learning the subject
Problems	Procedures to deal with performance problems	Few procedures to deal with performance problems
Duration	1 day to years	A few days to a few weeks
Evaluation	Based on responsibilities	Usually collective in a study group--all get same grade

Analysis of student needs

The subject of collaborative learning appears in recent distance education literature; however, the focus is on helping teachers create an environment that facilitates the practice rather than preparing students. Authors who acknowledge the need for preparation mention technology, online etiquette, and web skills (Zafeiriou, Nunes, & Ford, 2001). Journal articles and books discuss course design and what an instructor should do after students are enrolled in a course (see Hansen & Stephens, 2000; Palloff & Pratt, 1999). Most research appears to be devoted to analyzing the characteristics of computer mediated conferencing (see Briton, 2001; Dede, 1996; Warschauer, 1997; Zafeiriou, 2001). Unfortunately, there is a paucity of information directed to students to prepare them for the collaborative experience. Perhaps this situation exists because online collaborative learning is a relatively new addition to distance education, and there has been insufficient time for the needs of students in this area to be acknowledged. Students need both knowledge and skills to be successful collaborative learners, and focussing on only one of these needs sets is likely to be insufficient. Even among the elite VW students of AutoUni phase one, it should not be assumed that they will have the full knowledge and skill sets necessary for the distance environment.

Knowledge

- Self-awareness: personal preferences, personality type, learning style, learning goals
- Other-awareness: sensitivity to others, appreciation for diversity of thought and culture
- Characteristics of collaborative learning
- Value of collaborative learning

Knowledge requirements begin with the student's need to understand and articulate his or her personal learning style, preferences for study and interaction, and personality type. This awareness can help him or her assess the assets they bring to a collaborative environment and the roles they would best be suited to fulfil in learning activities. In addition to improving their self-awareness, students need to develop other-awareness, particularly in a distance learning format where sensitivity to others and appreciation for diversity of thought and culture are both difficult to maintain and express. The value of collaborative learning is not readily apparent to new students, particularly if they have not been introduced to its principles. The knowledge of how collaborative practices can benefit them as well as their classmates can help provide the incentive for engaging them in class activities.

Skills

- Conferencing and communication
- Group formation
- Project planning
- Project management
- Negotiation/conflict management

Conferencing and communication skills are obvious needs in any online collaborative environment, but there are other skills critical for success in small learning groups. A major reason why students can benefit from preparation in these skill areas is that CLGs have very short time frames for completing assignments. Lack of knowledge about group formation, project planning, project management, and conflict management cost the CLG precious time just working through the logistics of the assignment and attempting to reach agreement on what is to be accomplished. Time pressures can shift the focus to creating a product rather than meeting deep learning objectives that were the intention of the course designer. Instead of collaboration, the exercise may become a division of labor in which CLG members experience learning only from their individual efforts in one segment of the project. They miss the learning that can occur as a result of open discussion of major issues for the whole project and an exchange of diverse ideas and approaches to problem solutions.

A course for developing collaborative learning skills

During the fall term 2002, a prototype course was delivered to a group of UMUC graduate students participating in the UMUC-Oldenburg Master of Distance Education (MDE) program. "Introduction to Online Collaborative Learning" was designed to prepare students for working in an online environment by explaining the principles and benefits of collaborative learning, helping students to become more aware of their learning characteristics and personal assets, and providing opportunities to experience the concepts and practice the skills of collaboration. The course was presented using UMUC's WebTycho learning platform. WebTycho supports online access to course materials, threaded conferences, chat room, student bios, email, and study group space with its own conferences, chat room, and collaborative documents.

Overview of the prototype course

Course materials

In the absence of a text book that addresses collaborative learning from the student side, a study guide was created to introduce the concepts of participating in collaborative learning and offer questions for reflection during the course. Study planning aids included a comprehensive syllabus, a course calendar, and a reading/activities checklist. Links were provided to online resources for personality and learning style assessments and journal articles related to the subject.

Course structure

The three-week course consisted of three main modules and several additional specialized conference threads. Following a welcome day conference, the first module covered the basic principles of collaborative learning and established a baseline of student knowledge. Student activities included assigned readings, moderated conferencing, use of online resources to conduct their personal assessments, and preparation of a paper describing their personal learning style, personality type, and personal assets relevant to collaborative group activities. A "Personal Assets" conference thread was set up to allow students to post their papers for use as resources during study group formation. The second module introduced guidelines for participating in collaborative activities; examined the process of group formation, project planning, and project execution; evaluated communications methods for group activities; and explored techniques for resolving group differences. Student activities included assigned readings, moderated conferencing and the preparation of a paper considering which step in study group work might be the most important.

The final module consisted of a group exercise in which students were to apply the concepts presented in the course and practice collaborative learning skills. The group exercise (entitled MYSTERY!) was established as a web site with hyperlinks designed to require appropriate process analysis to explore the site. The group was instructed to work collaboratively as a group of detectives whose task was to solve the mystery of what went wrong in an online course and prepare a report of their findings. Included in the site was a "crime scene," a victim, a set of bios for potential suspects, a transcript of an online conference, and a detectives' tool kit. The exercise combined constructivist principles for learning with a game approach to: a) capture students' interest; b) promote further bonding in the study group; and c) present a problem whose solution would require an in-depth analysis of collaborative learning. Following the last module, students were asked to provide evaluative comments regarding the course and reflect on how the course had improved their knowledge and skills for online collaborative learning.

Student reactions

The course was designed to address the needs of students with some experience of collaborative learning as well as those who were just beginning an online program. Students taking the prototype course had completed several courses in the MDE program, yet they all reported a substantial increase in their understanding of collaborative learning. In addition to finding the course materials helpful and the group exercise both entertaining and practical, students agreed on some important benefits of the

course. These include: 1) definition of the principles of good collaborative practice; 2) presentation of the critical elements for successful collaboration; and 3) an instructional approach that enables students to experience the concepts and engage in deep thinking about collaboration.

Course enhancements

There are several ways in which the course should be enhanced and expanded.

- Extension of the course from three weeks to a full term
- Expansion of the Study Guide
- Rubrics for student and class evaluations
- Additional modules: writing for online conferences; how to evaluate comments, sources; diversity (of country, culture, or opinion); netiquette; and conflict management

There are two reasons for extending the course beyond three weeks. First, adding more modules demands more time. However, a more important reason argues for an extension of calendar time in addition to more study time. Building a collaborative learning community requires not only the appropriate knowledge and skills but also time and opportunities to bond with fellow learners and establish the trust needed for in-depth discussions and healthy debate. Students who are just beginning to acquire the knowledge and skills also need more time to practice in collaborative activities that are not subject to the tight time constraints of the distance class environment where performance will be assessed and awarded a grade or certification. It is reasonable to expect that students who begin a distance program with a highly positive collaborative learning experience would seek to repeat that experience in subsequent course work.

Other enhancements include expansion of the study guide to cover material in additional modules, rubrics to provide assessment tools both for individual students and for the class as a whole, and five new modules. Many students are ill-equipped for writing in an asynchronous learning environment and need tutoring and practice in writing clear, concise, and well-constructed comments expressed in an appropriate style and tone. Similarly, they may need assistance in evaluating the comments of other students as well as sources of information consulted for the course. Today's distance learner may encounter fellow students from a variety of countries, cultures, or opinions. In the AutoUni context, VW students constitute a global community. Appreciation for diversity in every form is often a trait that must be developed through increased awareness and experience with those of different orientations. The conventions of "netiquette" can help learners ensure they are expressing themselves as intended in an online environment. And finally, a module in conflict management can aid in resolving differences of opinion and misunderstandings, particularly those that seem to be leading to hard feelings within the group.

Conclusion

The students of AutoUni can benefit from a course similar to the one described to prepare them to be collaborative learners in a distance environment. While VW employees of the first phase have the advantage of company commitment, a preparatory course can help them translate that commitment to the context of a learning group where the perception of value to the individual (and his/her contribution to the company) may be key to personal investment in the group. As AutoUni enters phases two and three, such a course may be a significant contributor to the success of the program. Introducing and enhancing the course during phase one can enable AutoUni to do research that provides insight to the degree to which such a course would have a positive impact on the level of success, retention rate, and overall satisfaction of its distance learners. Studies following treatment and control groups throughout the AutoUni distance program could provide the return on investment data needed to justify providing learner support in this area.

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Author:

Linda Smith,
MDE Student
3776 Stone Road
Taneytown, MD 21787
USA

SORTING OUT THE TOOLBOX USING WEB CONFERENCING AND SUSTAINABLE COLLABORATING - CREATING INSPIRING PROXIMITY AT A DISTANCE WITH E-MODERATING

Charlene Templeton, Harford Community College

Introduction

Online learning has democratized academic training and corporate education as programs originally reserved for select groups can now be distributed more efficiently to a broad audience of learners through web-based channels. Volkswagen AutoUni is an example of combining academic degree programs and certificate courses tailored to management thus engaging in the true sense of both parts of the term Corporate University (www.autouni.de). Today thousands of online corporate training courses are available in three primary categories: specialized technical training, courses developed by companies that specialize in corporate training, and semester-length college, undergraduate and graduate classes, also hybrid classes like Volkswagen AutoUni that blend online with classroom instruction. Brian Nauman, senior manager at Ernst & Young LLP believes cost savings and convenience are the two reasons online training is growing in popularity (Murphy, 2001). In some cases, companies can save 75% and more with online vs. traditional classroom instruction, according to Michael Brennan, senior analyst at International Data Corporation (IDC). IDC estimates U. S. companies invested a total of \$2.2B in online training in 2000 and will spend \$14.5B annually by 2004 (Murphy, 2001). Lockheed Martin Corporation, which developed computer ethics courses in-house, slashed its training budget by two thirds (Reedy, 2001). Because of the cost advantage, convenience of scheduling and ease of tailoring delivery to students needs, online corporate training is being used in many industries in the U.S. and around the world.

With the explosive growth in online training, there are many challenges facing both academic and corporate organizations. Critics are concerned that certain subjects such as leadership training lose impact without learner/teacher interaction. A few studies suggest that learners retain less material in an online class. Some reports indicate online learners don't have the same motivation as classroom learners, which can result in completion rates as low as 10% in some online settings (Murphy, 2001). Drawbacks to online programs include never bothering to finish, no connection between training and real world application, lack of learner participation, lack of community, and the inability of learners to share valued information, expertise and insight during or after the training (Rosenberg, 2001, p. 66). Moore and Kearsley (1996) underscore that careful management is needed to cultivate community in online learning environments. They state that, "participation is not likely to happen unless it is deliberately planned and the faculty/moderator encourages it" (p. 119).

Many communication tools are used to inspire proximity, increase participation, to motivate learners, to enhance the processing of content by learners, and to give and receive feedback (Wagner, 1997). E-Mail and chat rooms are tools that fit the short duration characteristics of the interaction stage of community building. Both are good one-to-one communication tools and they are useful in collaborative activities. Web conferencing tools support collaboration because of the longer duration of the activity for both large and small groups and can be used to coordinate and manage learning experiences that compliment online learning. Web conferencing can resume discussions and feedback regarding what was learned and can be used to reinforce community building by combining voice, graphics, audio, live video, and the sharing of knowledge (Rosenberg, 2001, p. 141). However, simply using new communication tools is not enough to improve the learning process, to build sustained cooperation and community interaction. Instructors must have a unique array of skills to e-moderate so that learners are connected through joint activities and become interdependent or look to each other for mutual support as the course progresses.

This paper reviews the impact of an e-moderator in a web conferencing environment from the author's experiences with online training using web conferencing in open enrollment and corporate training. The author suggests lessons learned that are directly applicable to corporate training in the AutoUni context, and guidelines for corporate instructors who develop online instruction.

Transforming Teaching and Learning With an E-Moderator

What is an e-moderator? A moderator is a person who presides over a meeting; an e-moderator presides over a virtual conference but requires a rather wider and distinctive range of expertise than online instruction (Salmon, 2000). In order for AutoUni to maintain a climate of global proximity that focuses on continuous interaction, communication and collaboration, instructors must know how to build communities, boost learner participation and come to terms with the environments, norms and ways of communicating available in web conferencing (www.autouni.de). Collaborative learning is the key issue for training e-moderators. Collaborative learning is defined as a cooperative effort between instructor and learners and among learners and is the cornerstone of the online learning environment. This is also true in web conferencing where the instructor sets the course in motion, assures the participation of the students, monitors activities, and intervenes when necessary. When the strength of web conferencing is understood, learner-instructor expectations are aligned from the outset of a course.

Five Stages of E-Moderating

The author used Gilly Salmon's five-stage e-moderator learning model to train and prepare instructors for synchronous online work. Salmon's model for skills development is designed for Computer-Mediated Conferencing (CMC) and is fine tuned for web conferencing. The e-moderator's role changes at different stages depending upon learner needs and circumstances within the class (2000). Therefore, it is important to know the "audience" which is constantly changing from class to class.

- Stage one: Accessing the System and Motivation - individual access and the ability of participants to use web conferencing are essential prerequisites for conference participation.
- Stage two: Online Socialization -involves individual participants establishing their online identities and then finding others with whom to interact.
- Stage three: Information Exchange – participants give information relevant to the course to each other. A form of cooperation occurs, i.e., support for each person's goals.
- Stage four: Knowledge Construction – course related group discussions occur and the interaction becomes more collaborative. The communication depends on the establishment of common understandings.
- Stage five: Development- participants look for more benefits from the system to help achieve personal goals, explore how to integrate web conferencing into other forms of learning and reflect on the learning process.

These five stages are essential prerequisites for web conference e-moderators to grasp as each step builds upon the next. Stage one, is the base, where the e-moderator becomes the social and technical support welcoming and encouraging learners. E-moderators at this stage need to motivate learners recognizing that "hand holding" may be required for those learners lacking confidence (Salmon, 2000). Stage two involves the e-moderator bringing learners frequently, indeed almost continuously, into actions by asking questions, encouraging learner presentations, getting learners to talk to each other, and in other ways involving them fully in the teaching-learning process (Moore & Kearsley, 1996, p. 71). At stage three the e-moderator is facilitating tasks and supporting the use of learning materials. The e-moderator integrates course activities and assignments that use web conferencing to widen viewpoints and stimulate debate. At stage four, course related discussions occur and the interaction between learners becomes more collaborative. At stage five, the e-moderator is supporting and responding as learners look for more benefits from web conferencing for application of the course for their own work and explore how to integrate web conferencing for uses beyond the classroom.

Incorporating E-Moderating

E-moderators must be explicit about instructional strategies and the value of web conferencing as another tool in online learning. Johnson and Johnson (1993) found that cooperation among learners would not occur unless the students were trained in cooperative strategies. Providing adequate training can be a challenge for an e-moderator. However, the following suggestions for ways in which cooperation can be gradually developed in a web conference can help overcome obstacles. With these activities, students can learn collaborative techniques while they learn course content.

- Student introductions. Begin with an introduction activity. This can be done with profiles and using web cams to provide visual pictures of the class. These profiles can be used to get a sense of which community members might work well in a group together based on careers, learning interests, and time commitments.
- Preinteraction. Begin the content activities with tasks that a learner can accomplish individually. This will give learners time to get to know one another through the introductory exercises and to become familiar with the basis of the web conferencing technology before adding the stress of coordinating activities with a peer or group.
- Interaction activities. It is good to plan about two weeks for new learners to become comfortable with web conferencing environment. Once learners are comfortable, introduce an activity that requires interaction between two peers, such as having each one review the other's reflections or allowing them to question each other on factual or core content.
- Collaboration activities. At this point, two or three dyads can be merged to form a recommended group size of four to six students (Harasim, Starr, Teles, & Turoff, 1997). Balancing expertise within each group as much as possible is a worthwhile practice. Small group discussion is a good strategy for the groups to learn consensus building and begin forming interdependency by focusing on resolving a problem or dilemma.
- Cooperative activities. Effective face-to-face activities can also be used in a web conferencing environment. Activities that include roundtable discussions, role-plays, and team projects used throughout the course are an effective way to develop cooperation. Varying roles can assist learners in organizing themselves and developing self-direction (Cohen, 1972; Rudduck, 1978; Brochet, 1989, Harasim, 1977).

Lessons Learned

Salmon's model is best suited for instructors working in a dedicated online and web conferencing environment. The author found that e-moderating worked best when there were two instructors team teaching because of the requirement of time, effort, and commitment. Sometimes building community can appear to interfere with the positive aspects of time independent and self-pacing. The class must stay together in some manner to communicate on the same topics during a particular time frame. A person falling behind can be detrimental to the community. When collaborating, adult learners may discount a critique that comes from a peer they do not perceive to be an expert in the same sense that an instructor is expert. Central to the theme of e-moderating is online learning behaviours and there may be learner socialization issues that do not respond to this model. Peer communications can be hindered, by an inept e-moderator. It is important that the e-moderator be a content expert.

Guidelines for Using E-Moderating at AutoUni

The author realizes that e-moderators are challenged by a diversity of students who have a variety of expectations, learning styles; computer and communication skills that influence their web conferencing participation. Even so, the author recommends Salmon's five-stage approach learning model as a new and constructive guide to train and prepare instructors in a synchronous and asynchronous environment. Many practical elements of e-moderating include conference housekeeping, understanding lurkers and the silent free loader, someone happy to use other people's contributions rather than feeling the need to contribute (Salmon, 2000). The author found that instructors had enthusiasm and a greater understanding

of how they can become effective in the new e-moderator role because they recognize its essential focus for continuous interaction, communication, and collaboration.

Web Conferencing Tools

Web conferencing is a communication tool to connect the learners with the e-moderator over the Internet using simultaneous live voice broadcasting, web images, and data transmissions. It's the "live" synchronous communication that takes place in real time. It is scheduled, and all parties – learners and instructors – must be present at the same time, just like any classroom event (Rosenberg, 2001). Web conferencing meetings are instantly more visual and dynamic and add the human connectivity missing in an asynchronous online course. Instructors and learners can present PowerPoint slides, share documents, and deliver presentations to small or large groups and access-archived information anytime, anywhere.

The nature of teaching and learning does change when it leaves the classroom (Palloff and Pratt, 1999, p. 4). The issue is not technology; it's maintaining relationships between instructors and learners whether the interaction takes place face-to-face or on the web. There have been criticisms about the use of web conferencing from the cost of synchronous technology, to concerns for instructional design, to scheduling meetings across different time zones and the ease of use.

Web conferencing provides a robust platform for learners to support and assist each other, make decisions synergistically, and communicate with peers on a variety of topics beyond those assigned. While synchronous programs can be developed in-house at considerable cost, web conferencing services provide easy to use, on-demand web conferencing that is designed appropriately for distance learning. Web conferencing services are designed with reliable, scalable, and secure technology, many with no up-front fees or set-up costs, no special hardware or software, using pay-as-you-go rates as low as 16 cents per participant-minute, available 24/7 with dedicated customer service.

The author investigated web conferencing services including MeetingOne, NetMeeting, and Genesys Conferencing. WebTrain.com web conferencing was selected because of its ease of use, minimal training and computer skills required, ability to transmit live voice one-to-one and one-to-many, simultaneously transmit data with PowerPoint, whiteboard, bulletin boards, screen cast, broadcast webcam images. WebTrain offers multiple secure, highly interactive virtual conference rooms, archival retrieval of conference notes, 24/7 access and technical support and a bulk purchase discount of 1,000 hours at 8 cents a minute (www.webtrain.com). Minimum PC requirements to participate in the conference are Pentium-class 120 MHz PC or better, Windows 95,98, 2000 or XP, IE 5.0 or higher, full duplex sound card, 28.8 kbps Internet connection or better, headphones or speakers, microphone for voice communication, and web cam (any brand) to broadcast your image.

Integrating Web Conferencing

A key issue for Volkswagen AutoUni is how and when to integrate web conferencing technology with face-to-face and online instruction for effective training results. There are innovative ways to use web conferencing to enhance the learning experience and collaboration by learners who are separated by distance. One suggestion is holding a large or high profile meeting using web conferencing that enables many people to participate. While this may be less instructing and far more communication, there is value in enabling more people to be exposed to the original content than otherwise possible. Short, scheduled live presentations, online chats, or other synchronous events can introduce subject, and the instructor can assign work and set expectations. Most of the actual learning takes place asynchronously, using online training, knowledge management, and other resources. The synchronous class might resume with discussion and feedback regarding what was learned (Rosenberg, 2001, p. 141). Synchronous sessions for brainstorming, focus groups, mini-lectures and alternative lectures provide a common place for learners and instructors to build trust and share ideas.

Lessons Learned

Web conferencing requires more time, effort, and commitment on the part of the instructor and every member of the class. Minimum PC requirement may not be available to all learners. Discomfort with web conferencing technology can impede collaboration and use. The author found that not all web conferencing services are alike. Bells and whistles do not mean better. Pilot each service before committing to deploy at your organization. Look for tools that are easy to use, standardized, and user friendly. When the Internet is down, access to the web service is interrupted. Firewalls can prohibit access in some cases; however, technical support can work around this issue. Learners can have negative perceptions of collaboration using web conferencing if all members of the group are not fully engaged in the process (Hiltz, 1994). Scheduling meetings requires extensive planning to coordinate schedules across different time zones. Class size should be limited to 18 to insure ‘air time’ and attention from the instructor and provide adequate collaboration time.

Guidelines for Using Web Conferencing at AutoUni

Practical attention to instructional aspects is important for fostering successful instructional experiences. Web conferencing increases the likelihood that different perspectives will be introduced and supports quick and easy communication that is planned to compliment online and face-to-face instruction. Web conferencing synchronous technology is standardized with commonly used presentation packages such as PowerPoint to convey ideas and share content. Understanding when to use technology as a tool to support collaborative learning yields a higher level of comfort and confidence when instructing in the synchronous environment. Depending on the subject matter and the preference of the instructor, most instruction can be supplemented by synchronous sessions. This makes transforming online asynchronous discussions, collaboration and activities easier in the web conferencing arena. Discussion groups using web conferencing are more thoughtful and have more of a sense of community.

Conclusion

The importance of communication detailed in this paper in relationship to developing a collaborative learning environment at Volkswagen AutoUni does not just happen in web conferencing. The definitive role of the instructor/ e-moderator is crucial for setting up the channels for effective downward, upward, and horizontal communication (Gibson, Tesone, Blackwell, Kelsey, 2002). Leading a synchronous discussion is a skill that must be developed. Many beginners make the mistake of putting themselves in the middle of the conversation, establishing private conversations with each member of the class. This quickly overwhelms the facilitator and interferes with learner-to-learner collaboration. The effective facilitator is trained in e-moderating techniques that focus on continuous interaction, communication and collaboration. Instructors must know how to build communities, boost learner participation and come to terms with the environments, norms and ways of communicating available in web conferencing. The potential of e-moderating in a web conferencing environment is enormous. A true corporate university can combine the richness of education with the cost saving benefits of online training and web conferencing that benefits employees. The e-moderating model applied to web conferencing should play a key role at Volkswagen AutoUni in the online Corporate University strategy for learning.

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Author:

Charlene Templeton

MDE Student

Harford Community College, Continuing Education and Training, Computer Training

410 Thomas Run Road, Bel Air, MD 21014

ctemplet@harford.edu

MSIP ONLINE — MASTERS DEGREE IN MATHEMATICAL SCIENCES DELIVERED TO A WORKPLACE

Anna Dostovalova & Anne-Marie Eliseo, Centre for Sensor Signal and Information Processing

Keywords and acronyms

MSIP: Master of Signal and Information Processing; CRC: Cooperative Research Centre; CSSIP: Centre for Sensor Signal and Information Processing; DSTO: Defence Science and Technology Organisation

Introduction

In this paper we give an overview of the process of development and functioning of an on-line resource known under the acronym MSIP-online. We also examine how this program is uniquely tailored for students in the workplace.

What is MSIP-online?

MSIP-online was created in support of learning towards the Masters degree in Mathematical Sciences (Signal and Information Processing) accredited by The University of Adelaide. MSIP — the Master of Mathematical Sciences (Signal and Information Processing) is a vibrant Masters by coursework program, which provides world-class training to engineers and scientists in and beyond Australia. Commencing in February 2001 as an on-line suite of courses with global access, it replaced the original program, which consisted of a handful of courses available only to local South Australians. A total of thirteen courses make up this Masters program and each of these courses may be studied in an entirely on-line mode.

MSIP-online is hosted by the Cooperative Research Centre for Sensor Signal and Information Processing (CSSIP), and a number of Australian universities have contributed to it by committing their lecturers to the program.

The Education Charter of CSSIP

In 1990 the Australian Government introduced an innovative scheme, the Cooperative Research Centres (CRC) Program, as a way of maximising investment in research and strengthening links between universities and private industry. Currently seventy one Cooperative Research Centres are funded by the Australian Government. Their focus is on technology transfer, from researchers to research users or industry. An essential element of this process is providing appropriate education and training resulting in a high quality work force in tune with industry needs [2].

The Education Charter of CSSIP is to deliver high quality, post graduate training to scientists and engineers working in the field of signal, information and image processing in a manner appropriate to the needs of industry.

An important part of this Education Charter has been the establishment of MSIP-online as a Masters by Coursework program, which can be benchmarked against the best international standards. The development of this program has come at high resource cost to CSSIP, which nevertheless has maintained a commitment to MSIP-online and responded to its challenges so that it can carry out its Education Charter.

How does MSIP- online support the learner in the workplace?

CSSIP being a consortium of five Australian universities, DSTO (a Defence based research organisation) and two industry partners, is uniquely placed to engage in continuous dialogue between its researchers and teaching staff and its end users who work in DSTO and industry. It has been able to use to advantage its links by developing an innovative Masters program drawing on the expertise of its partners instead of just one university.

Before 1997 there was not a single Australian Masters by Coursework Program in Signal Processing. DSTO, in particular, expressed a need to recruit new employees as well as to train existing staff in this highly specialised area. They were looking for a program that could offer prospective PhD students a solid grounding. Input was sought from DSTO and end users from industry about the type of courses that would constitute this highly challenging Masters program.

In 1997 five courses delivered in face-to-face teaching mode were mounted in response to DSTO and others' needs. Students enrolled in the program were all full time employees of DSTO.

The highly rigorous nature of the courses meant that the students needed considerable support from their employers. They were allowed to attend lectures several afternoons a week and were given some extra time off work for study. However the requirement that students travel to lectures several times a week took its toll and by 2000 there were no enrolments.

In 2001, to overcome the difficulties caused by the distance, the program was put online with new and existing courses being developed over an eighteen month period so that thirteen courses can now be delivered in an online mode [12].

As a result, students are now able to study courses from any geographical location in Australia or beyond it. Those in the workplace can do it with the flexibility offered by distance education, without much interruption from the tasks of their jobs. Projects are an optional part of the Masters Program and students are encouraged to choose supervisors from their own workplace, as well as a university, and to make their project area as relevant as possible to what they are dealing with in the course of their jobs. In addition, working students, even when they are not in the same geographic location, are motivated to form study groups so that they can support each other and share their efforts in dealing with the challenges they face. Having a network of its former staff and PhD students CSSIP is capable of helping with mentoring issues thus adding an extra dimension to the on-line support provided by the academic staff.

Resource organisation

The cornerstone of MSIP-online is a set of course modules, which are structured to incorporate the standard phases of learning. The following thirteen courses are available online:

- Adaptive Signal Processing
- Beamforming and Array Processing
- Kalman Filtering and Tracking
- Introduction to Discrete Linear Systems
- Satellite Communications
- Mobile Communications
- Information Theory
- Image Processing
- Mathematical Coding and Cryptology
- Signal Synthesis and Analysis
- Spectral Estimation of Stationary Processes

- Multisensor Data Fusion
- Detection, Estimation and Classification

The resource is organised as a web-archive with access to each subject module controlled by the basic authentication scheme [7, 11], Figure 1 illustrates the structure of the archive. Additional access control employs document-level security available via the PDF. This is a reasonable degree of protection required to reduce the risk of interference from outside and to safeguard the intellectual property.

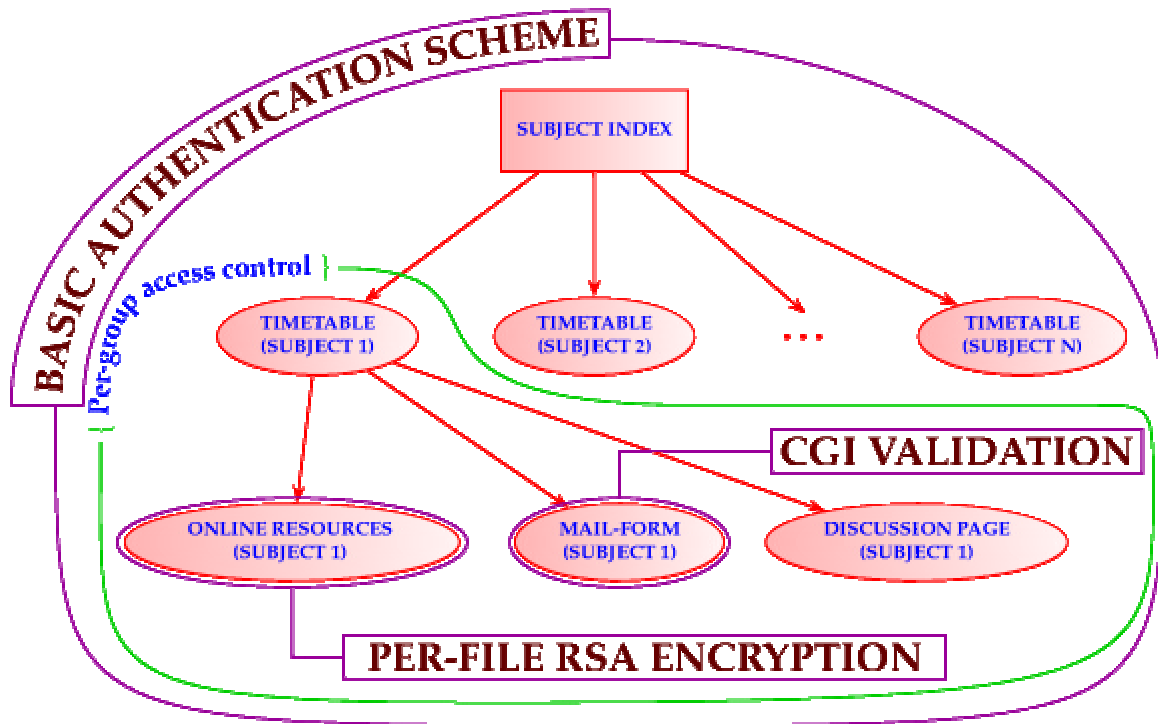


Figure 1: The structure of the MSIP-online and access control of its resources

The subject index page contains the links to the on-line modules and pages with the general information about the archive and used formats. Lecturers coordinate their students' work via the timetable pages and progressively updated course materials, which include lecture notes, tutorials, assignments, past exam papers, solutions, and Matlab codes. The pages with the timetables are open to all MSIP-online users but only those students who have been enrolled in a particular subject have access to its reference materials. Most of the course materials have been professionally set in hyperref-enhanced LaTeX [4, 5, 6, 10] and converted into Adobe Portable Document Format (PDF) [1], which has become in recent years a *de-facto* standard for electronic exchange of documents. PDF was chosen not only because its viewer Acrobat Reader is freely available for all platforms, but also because PDF allows to furnish electronic documents with advanced interactivity and, as a direct PostScript descendant, PDF preserves good printing quality of text and graphics.

Standard Unix utilities, Perl scripts [3] and the CGI mechanism [8] are used to provide the resource with a number of essential interactive tools, which include web-based mail-forms and discussion boards.

These tools are individual for each subject, and together with the ordinary e-mail and mail, they form a medium for communication between the lecturers and students. Mail-forms proved to be useful in situations when students had access to the Internet but, for one or another reason, could not use their mail-servers. Discussion pages were designed for lecturers to answer student queries or to make announcements, and for students to exchange their ideas, and post their questions or concerns. We have full control over the scripts which drive these pages and occasionally modify them to accommodate some specific needs of our users. For example, one of our lecturers who had a good

command of html requested that we implement the mode in which the input is interpreted as an html-code, another lecturer wishing to reduce the time of response to students' queries suggested that each posting be accompanied with an e-mail notification. Having an extensive teaching experience of university mathematics the web-developers also suggest and implement their own solutions. However, since our priority has been generating on-line subject materials and assisting with their maintenance and deployment, we have to be somewhat conservative if the need for the requested web feature or tool is not in balance with the effort and cost required for its development.

Since each MSIP-online user is given access only to the materials of the subjects he or she is enrolled in, we have incorporated setting access control properties into the enrolment procedures, which, with the growing number of students, has had to be automated. Again Perl scripts are used to drive this process, and just before the semester starts all access data files are updated and each student receives a welcome letter with the password information.

Course materials: some aspects of production

Course materials have always been an essential component of teaching. In distant education they become the prime medium for communicating the knowledge and guiding the studies, which imposes somewhat more stringent standards on their quality. Ideally lecture/course notes must be concise and yet include as much detail as necessary to be self-contained. On-line delivery implies that the files with course notes have a reasonable size and their visual and printing output is satisfactory. Formats and viewers allowing the use of hyperlinking and text-search utilities are preferential. As we indicated above, we have chosen to use LaTeX for electronic publishing of our courses. TeX and LaTeX initially created for fast and nice typesetting of text and mathematical formulae [9, 10] have been well adapted for the needs of the web-publishing [5]. The MSIP staff responsible for preparation of on-line materials are dedicated LaTeX users with a considerable experience of employing it for typesetting of mathematical papers and course notes, generation of portable graphics, and publishing on the Internet.

Our lecturers often use LaTeX support provided via MSIP-online in the work with their Universities where they deliver similar courses. MATLAB extensively used by our lecturers is also well integrated into the production process, and we readily share our expertise with them in this area as well.

Conclusion

After almost three years of operating in an on-line mode, MSIP has proved to be a viable program. Its resources are now organised in a modular web-environment with a controlled access and a reasonable degree of interactivity. Maintenance of this environment involves dealing with many aspects of the educational process, from enrolment procedures and site management to generating/updating and deploying subject materials. Much of our work requires synchronization with the lecturers' effort, and coordination with our stakeholders. The program is flexible and adaptable to the needs of our students many of whom directly relate and apply the received knowledge to their workplace challenges.

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Authors:

Dr Anna Dostovalova
MSIP-online web-site developer/manager
CRC for Sensor Signal & Information Processing (CSSIP)
adostova@cssip.edu.au

Anne-Marie Eliseo
Education Program Manager
CRC for Sensor Signal & Information Processing (CSSIP)
aeliseo@cssip.edu.au

SUPPORTING E-LEARNERS WITH FAULT-TOLERANT FULLTEXT RETRIEVAL

Wolfram M. Esser & Holger Höhn, University of Würzburg

Abstract

We present a fault-tolerant fulltext retrieval system built into our multi-centric e-Learning environment DEJAVU (*Dermatological Education as Joint Accomplishment of Virtual Universities*). This fault-tolerant search engine empowers medical students to look up arbitrary text fragments from learning materials like case-studies or lecture scripts. Especially large e-Learning systems, where content is often generated by multiple authors run the risk of using different spellings for the same scientific term. Also beginner students often produce spelling mistakes in search queries, because they are new to a certain learning context.

So, we present a fault-tolerant approach which may be added as a front-end to any fast non-fault-tolerant retrieval system to enable approximate searching. Our “weighted pattern morphing” algorithm circumvents some of the disadvantages of typically used approximate search algorithms, which rely mostly on the edit distance metric. By weight fine tuning our algorithm can easily be adapted to different text corpora and languages, which is important in a scientific context.

Weighted pattern morphing has proven as a robust and fast method for fault-tolerant fulltext retrieval not only inside the DEJAVU e-Learning system, but also in large commercial electronic encyclopaedias – online and offline.

Introduction

In recent years based on psychological papers like e.g. [1] the focus of learning environments has shifted more on learners and their learning behaviour away from teachers and learning content. Especially e-Learning systems provide more freedom to their users by “anytime and anywhere” availability which leads to a higher learner's satisfaction.

A lot of projects in all developed countries try to improve teaching success with e-Learning systems. In Germany the secretary of education (bmbf) funded €25 million to force the so called “Notebook University” (see [2]). These projects want to reduce education costs on the one hand and aim at higher learning stimulation on the other hand. Equipped with state-of-the-art PCs even complex multimedia content can be offered to students, which may increase the 'fun' of learning significantly.

DEJAVU [3] (*Dermatological Education as Joint Accomplishment of Virtual Universities*) is a bmbf funded project cooperation of the dermatological clinics of the Universities of Berlin (Charité), Jena and Würzburg together with the psychological department of the University of Jena and our chair of computer science II at the University of Würzburg.

The toolset of DEJAVU consists of programs to add standardized keywords to clinical images, create and show multimedia lectures, retrieve images for these lectures from a large database, and finally publish these lectures on a closed usergroup section of the project's WWW server.

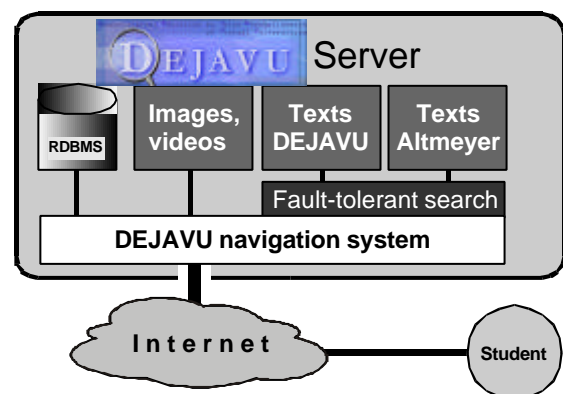


Fig.2: Building blocks of the DEJAVU server

The closed usergroup section is accessible to dermatology students of the involved clinics and contains (by the end of year 2003) about 75 digital lectures, 80 learning texts for different diseases and 20 patient reports for case-based learning. Together with the large amount of high-quality clinical and histological images, DEJAVU incorporates about 11,000 learning objects built by the participating 15 university lecturers and assistant teachers. On top of this content, a large dermatological online-encyclopaedia [4] is integrated into the e-Learning environment, which further improves the possibility of knowledge exploration and self-studying.

Learning objects, which are the atoms of every learning system (see [5]), today are mainly text objects, because written language is still the number one choice in transferring knowledge between people. Even if multimedia objects are used, most of the time attached texts describe the embedded movies, images and sounds. So, if usability and learner's satisfaction is important, the learning system provider has not only to supply navigation features like "guided tours" or "bookmarks" - even retrieval tools like local page search and fulltext search are necessary.



Fig.3: Userinterface of the fault-tolerant online search

Our fault-tolerant fulltext retrieval approach which is a suitable add-on for any other fast non-tolerant search engine is part of DEJAVU e-Learning system, Prof. Altmeyer's dermatological encyclopaedia (free online-access for physicians on [4]) and the commercial CD-ROM encyclopaedia HagerROM 2003 [6], which is based on the 12-volume print edition of the standard reference book for German speaking pharmacists and pharmacologists.

After a short survey of related work, we will present the architecture and algorithms of our fault-tolerant approach, which circumvents some of the disadvantages of common approximate search algorithms. We will also present some results of experiments we performed with our retrieval system.

Related Work

Offline search algorithms store their knowledge of the text in an appropriate index, where at most times one of the following four data structures is used (see [7]): *suffix tree*, *suffix array*, *q-grams* or *q-samples*. The non-fault-tolerant variant of our search engine uses a compressed q-gram index (with $q = \{1, 2, 3, 4\}$). When a q-gram index is created, the position of every substring Q with length q inside text T is stored in this index, which makes very fast searching possible (see [8] for details).

In [7] a taxonomy for usual approximate text searching algorithms is specified. According to this taxonomy, three major classes of fault-tolerant approaches are known: "neighbourhood generation", "partitioning into exact search" and "intermediate partitioning".

Various approaches have been made to combine the speed and flexibility of q-gram indices with fault-tolerance. Owing to the structure of q-gram indices, a direct neighbourhood generation is not possible in reasonable time. Jokinen and Ukkonen present in [9], how an approximate search with a q-gram index structure can be realized with "Partitioning into Exact Search". Navarro and Baeza-Yates in [8] use the same basic approach, but assume the error to occur in the pattern, while Jokinen and Ukkonen presume the error to be in the text, which leads to different algorithms. Myers demonstrates in [10] an "Intermediate Partitioning" approach to the approximate search problem on a q-gram index.

All the above methods are based on the definition of one of the two string similarity metrics by Levenshtein [11] called *Levenshtein distance* and *edit distance*. Both metrics calculate the distance between two strings by summing up the minimal costs of transforming one string into the other by counting the atomic actions *insert*, *delete* and *substitute* of single symbols (see [12] algorithms). Also, though these metrics provide a mathematically well-defined measure for string similarities, they suffer from the inability to model similarity of natural language fragments satisfactorily, from a human point of view.

For example $editdistance(kalzium, calcium)=4$ and $editdistance(kalzium, yalyium)=4$, are the same – despite the fact, that every human reader would rate the first two strings much closer together than the second pair of strings. Because the edit distance is more suited to model “pseudo-random” typing mistakes or other transmission errors, we needed a way to approximate patterns where the differences between text and pattern are less “random” but more due to the fact that a great number of authors may use the same scientific term in different (but correct) spellings. We also wanted to cope with the problem of non-experts knowing how a scientific term sounds, without exactly knowing the correct spelling. Our technique of *weighted pattern morphing* is described in the following section.

Weighted Pattern Morphing

As stated at the end of the previous section, the edit distance metric which is used by most available approximate text retrieval algorithms, is not appropriate, when one is trying to model a more human oriented string similarity. Weighted pattern morphing (WPM) circumvents the mentioned disadvantages with a simple but powerful idea (note: $|T|$ is length of string T):

Browse searchpattern P for all substrings $p_{i,j}$ ($1 \leq i, j \leq |P|$), which are part of a phoneme group G with $G = \{g_1, g_2, \dots, g_z\}$ and where $p_{i,j} = g_k$ ($1 \leq k \leq z$) and try to replace $p_{i,j}$ by all g_l ($l \neq k$) which are members of the same phoneme group G . Contrary to the edit distance measure is $|p_{i,j}| \geq 1$, $|g_l| \geq 1$ and even $|p_{i,j}| \neq |g_l|$ is possible. A pattern P' , where at least one substitution took place is called a „*morph*“ of P and a single substitution of $p_{i,j}$ to g_l is called „*submorph*“ $p_{i,j} \rightarrow g_l$.

As the application of different submorphs may have varying effects on the similarity of P and P' from a human point of view, the concept of penalty weights was introduced. Penalty weights of a phoneme group are stored in a two dimensional matrix, where source strings g_k are noted in the first column and destination strings g_l in the first row (see example table 1 below).

	c	g	k	...
c	–	–	1	...
g	10	–	10	
k	1	15	–	
...	...			

	1	one	2	...
one	1	–	–	...
1	–	1	–	
two	–	–	1	
...	...			

Tab.1: Two example penalty weight matrices (left: phoneme group *cgk*; right: numbers)

As the table demonstrates, not every possible submorph is allowed, and the table may be asymmetric to the diagonal. There exist submorph tables for every common phoneme group like “a/ah/aa/ar”, “i/ie/y/ih/ii”, “g/j”, “c/g/k/cc/ck/kk/ch”, and so on. The possibilities of the edit distance can be approximated by submorphs like $\epsilon \rightarrow \text{”?”}$ (insert any char), $\alpha \in \Sigma \rightarrow \text{”?”}$ (substitute a char c), $\alpha \in \Sigma \rightarrow \epsilon$ (delete), where ϵ is the empty word, Σ the alphabet and “?” is the one-letter wildcard for our search engine. But even more exotic submorphs like *solution* \rightarrow *sol.*, *acid* \rightarrow *ac.*, *5* \rightarrow *five* are defined, which is often helpful in a biochemical and medical context, because abbreviations are sometimes used and sometimes not (e.g. in Hager the terms “5-petaled” and “five-petaled” are used).

Every morphed pattern P' is then recursively fed into the same morph algorithm, to perform even more submorphs. To avoid recursion loops, the first index i_{\min} where submorphs $p_{i,j} \rightarrow g_l$ may start, is

always increased for deeper recursion levels. Loops otherwise may occur through submorphs at different recursion levels like $u \rightarrow v, v \rightarrow w, w \rightarrow u$. On every recursion level, P is also passed on to the next recursion level, with only i_{\min} increased.

Because the recursion tree can get large, the total penalty S , as sum of the penalty weights for all applied submorphs, and M , the total number of applied submorphs (=recursion depth), are updated for every recursion call. Recursion backtracking is performed when either S or M pass configurable limits S_{\max}, M_{\max} or when $i_{\min} > |P|$. Because S and M or i_{\min} grow with every recursion level, the algorithm terminates in reasonable time (see section **Experiments**).

Obviously, the above algorithm generates many morphs that are not part of the text corpus. Though the q-gram algorithm is very fast in finding out that a pattern has no hits in the text (this is so, because the search always starts with the shortest q-gram offset list, see [13]), pre-filtering of “nonsense morphs” was achieved by the introduction of the “hexagram filter”.

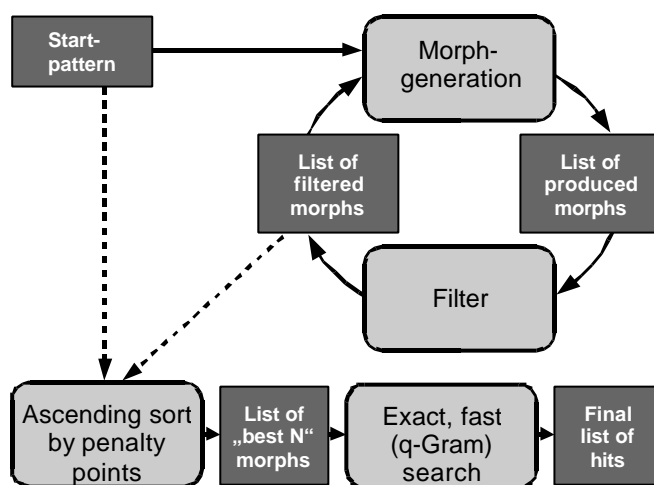


Fig.4: Application flow of weighted pattern morphing

The *hexagram filter* is a suffix-trie data structure with a maximum depth of six, but does not store actual offsets of hexagrams. It simply states whether a specific q-gram class ($q \leq 6$) exists in the text at all. Non existing branches are cut off. So when a morph P' is generated, the hexagram trie is traversed for every (overlapping) hexagram, that is part of P' . If any of the morph's hexagrams is not part of the trie, P' as a whole cannot be part of text T and is discarded. However, if all the hexagrams of P' are part of the trie, it may be part of T – but there is no guarantee that P' occurs in T , because all hexagrams of P' are part of T , though maybe not in the same order as in P' . In these cases we rely on the ability of the q-gram algorithm to terminate very quickly for those patterns that are not part of the text.

The best candidates of the final morph list, together with the original pattern P , are then sequentially fed into the fast, exact q-gram search engine (but every other exact fulltext search back-end is possible – even an SQL database system). The morphs that generate hits in the text corpus are then presented to the end-user. The graphical user interface allows the user to select and deselect from the list of occurring morphs, to post-filter variants of the original pattern in which the user is not interested. For example a fault-tolerant search in HagerROM for “kalzium” produces also morphed hits for “calium” (Engl.: potassium), which is a different chemical element.

Experiments#1

In the following section we want to present some experiments regarding the filter efficiency and the speed of the presented fault-tolerant approach. Based on the listed characteristics in the table below, we will use the text corpus of HagerROM 2002 for our experiments, because the true power of WPM

shows most notably on large texts which are a true challenge to a text retrieval system. The raw text size (without layout information) of HagerROM is about 13 times as large as “The Bible”. This huge amount of text and the vast number of about 600 contributing authors make the WPM based fulltext search an important part of the commercial CD-ROM product.

All experiments were executed on a standard PC with AMD Athlon® 1,33GHz CPU and 512 MB RAM on a local ATA-66 harddisk under Windows XP®. The compressed q-gram index $q=\{1,2,3,4\}$ needs about 450MB (this is 8 times |T|) storage space and can be generated on an average Linux computerserver in about one hour.

<i>Module</i>	<i>DEJAVU Texts</i>	<i>Altmeyer Dermatology Enzycl.</i>	<i>HagerROM 2002</i>
Text (with Layout)	1.0 MB	22.7 MB	121 MB
Raw text (w/o Layout)	0.4 MB	5.8 MB	53 MB
Hexagram filter	0.3 MB	1.2 MB	6 MB
q-gram index	4.3 MB	70.2 MB	450 MB

Tab.2: Characteristics of three products using WPM search

The following table shows the results of some experiments with fault tolerant searches an WPM. In brackets the number of actual hits of a searchpattern is given. We also tested patterns that were not part of the original text, but after passing the WPM algorithm produced morphs that could be found.

<i>Original pattern</i>	<i>MT [sec.]</i>	<i>ST [sec.]</i>	<i>UT [sec.]</i>	<i>#M</i>	<i>#F</i>	<i>#N</i>	<i>#H</i>	<i>Morphs with hits</i>	<i># w/o Hex.filt.</i>
azethylsalizyl (0)	0.23	0.12	0.53	1669	1655	14	2	acethylsalizyl(4), acethylsalicyl(435)	15035
kalzium (42)	0.05	0.01	0.23	343	336	7	5	kalzium(42), calcium(3750), kalium(2779), calium(4), cal?cium(3)	639
pneumokocken- polysacharid (0)	0.27	1.19	1.63	2283	2192	91	1	pneumokokken- polysaccharid(4)	129040
schokolade (54)	0.47	2.05	2.75	1578	1551	27	4	schokolade(54), shokolade(1), chocolade(1), chocolate(4)	6498
sulfamethoxy- diazin (2)	0.33	1.03	1.58	2739	2656	83	3	sulfamethoxydiazin(2), sulfametoxydiazin(17), sulfametoxydiazin(1)	24739

Legend:

MT=morph time: time consumed to calculate the best #N morphs; **ST=search time:** time consumed by the non-fault-tolerant search back-end to search for these best #N morphs; **UT=user time:** the total time the user has to wait for all results (with program launch time). **#M:** number of actual generated morphs; **#F:** number of morphs that did not pass the hexagram filter; **#N:** number of morphs that passed the filter with an acceptable amount of penalty weights; **#H:** number of morphs from the #N that produced at least one hit in the text corpus; **#w/o Hex.filt:** without hexagram filtering this number of (mostly useless) morphs would have been generated.

The above table demonstrates that on average PC hardware fault-tolerant text retrieval with practical search patterns can be realized with the approach of weighted pattern morphing in acceptable time. Within the shown examples the user has to wait an acceptable average of two seconds for his results. The hexagram filter prevents the algorithm from generating thousands of morphs that can't be part of the text and thus contributes to a quicker response of the system.

It becomes apparent, that the filter becomes less accurate with longer search patterns. This is due to the fact that the filter can only state that every six char long substring of a morph is part of text T. But the filter can't make any assertion if these existing six char long substrings of the morphed pattern also occur in the same order and same distances inside text T.

Experiments#2

In the following section we want to elaborate on the user impact of the fault tolerant search module. However, the mentioned e-Learning system DEJAVU serves a closed user group and thus the collected pattern and usage material seem not yet statistically significant.

As stated above, a further application of WPM is the fault-tolerant fulltext search facility of the online version of Prof. Altmeyer's dermatological encyclopaedia [4]. As this version is freely accessible over the web to physicians and medical students (e.g., of our e-Learning environment DEJAVU) since March 2003, we had the chance to collect about 21000 *single user patterns* that were searched for in the encyclopaedia over the last 10 month. About half of the patterns were searched more than once – so we got a total of about 7000 *different queries*. Table 3 shows the top-5 of the most wanted strings.

No.	Number of different searches on pattern	Pattern	Number of hits in "Altmeyer"
1.	259	psoriasis	935 hits
2.	179	akne	451 hits
3.	139	ekzem	1559 hits
4.	121	lichen ruber	301 hits
5.	111	melanom	397 hits

Tab.3: Top-5 user search patterns of online Altmeyer

From the 21000 searches 161 were performed with user-enabled fault-tolerance. These 161 searches break up to 47 low-tolerance, 27 medium-tolerance and 87 high-tolerance – which reveals the interesting fact, that most users chose the highest level of tolerance regardless of the additional calculation time.

Though the patterns of the table above all produce hits inside Altmeyer, there is a large number of 2094 of the 7000 different queries (nearly 30%) that don't produce hits in the first place. We examined these patterns closer and found out, that about 467 of these 2094 no-hit patterns (about 22%) could be found with applied fault-tolerance (see table 4 for examples, in brackets number of hits, submorphs in bold face and underlined). This led to the design decision to force fault-tolerance in case of search patterns that do not produce hits with normal, exact searching.

akne rosacea(0)	<u>ac</u> ne rosacea(5) <u>ac</u> ne rosa <u>z</u> ea(1)	hyperhydrosis(0)	hyper <u>h</u> idrosis(55) hyper <u>i</u> idrosis(1)
carzinoma spinozellulare(0)	car <u>z</u> inoma spinoc <u>l</u> lulare(4)	nävuszelnävus(0)	<u>n</u> ävuszell <u>n</u> ävus(122)
dishydrose(0)	<u>d</u> ysh <u>i</u> idrose(19)	papilomen(0)	pap <u>i</u> llomen(2)
erytema nodosum(0)	ery <u>t</u> hema nodosum(73)	suggilationen(0)	sug <u>i</u> llationen(9)

Tab.4: Examples of successful online-user pattern corrections

Conclusion

This article presented the e-Learning environment DEJAVU with its attached fault-tolerant fulltext retrieval system based on the technique of weighted pattern morphing. Our approach circumvents some of the disadvantages of the edit distance measure, which is the base of usually used approximate search algorithms.

Average PC hardware today is capable of performing multiple iterated non-fault-tolerant searches for a carefully generated set of variants of the original user search pattern. WPM uses this fact to repeatedly call the search-backend for every promising morph of the user pattern.

The strict isolation of fault-tolerant-frontend and non-fault tolerant backend makes WPM an ideal choice for other fast non-fault-tolerant search engines that need an optional approximation feature. Even database backends are possible, when fast searching is enabled via an appropriate index.

Especially, e-Learning systems should support their users with a fault-tolerant fulltext retrieval possibility to encourage students in autonomous explorative learning and to help them answer occurring questions on their own. The high usefulness of an approximate searching feature is due to the fact that the content of e-Learning systems is often generated by multiple authors which may lead to inconsistent spellings of scientific terms and students often are not sure about the correct spelling of a search term.

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Authors

Wolfram M. Esser, Holger Höhn
Chair of Computer Science II, University of Würzburg
Am Hubland, 97074 Würzburg, Germany
{esser|hoehn}@informatik.uni-wuerzburg.de

PRACTICAL COURSES IN DISTANCE EDUCATION SUPPORTED BY AN INTERACTIVE TUTORING COMPONENT

Rainer Lütticke & Hermann Helbig, FernUniversität in Hagen

Abstract

Preventing the time- and cost-consuming travel to practical courses in computer science for students at the FernUniversität (Open and Distance University) Hagen we have developed an Internet-based virtual laboratory (VILAB). There the students have access to complex software-tools and have to solve problems in different domains. During the problem solving processes the students get support by an interactive tutoring component. Based on the actions of the students during their work in VILAB, on the analyses of solutions or parts of them, and on a student model this tutoring component gives at once individual feedback. Additional support can be given by newsgroup, emails, or manuals. For regular teaching VILAB is used since summer 2002. The first results of our evaluation have shown that our learning environment has motivated the students, the solutions of the students are improved, and learning inside of VILAB was effective.

1 Introduction

In former times it was common at the FernUniversität that text courses were taught in distance and seminars and practical courses took place at our university. However, due to the personal situation of our students (work, family, disability, etc.) and economic aspects (travel costs, unproductive time of travelling) they have the demand to reduce the time in which they have to be present on the campus of the university. On the other side there is the problem of the sometimes felt isolation during self-studies and the request for more communication and feedback during their learning and working on exercises.

Answering these demands we have realised a new concept of practical courses using the virtual mobility created by the Internet, new ways of communication, and modern technologies for teaching. To reach this aim for the field of applied computer science we have developed a virtual learning environment. It based on the concepts of laboratories used for the education in natural sciences. In these labs the students are guided by a curriculum to several different experimental stations. There they can work on exercises and additionally, can test and deepen their theoretical and methodical knowledge getting support by an assistant. This paradigm is used for the realisation of our Internet-based learning environment for the education in applied computer science at our university. Therefore we have called it “virtual electronic laboratory” (VILAB¹). Its functionality is described in section 2. To integrate functions of a personal human assistant of a real lab into our learning environment, to support the students, and not to leave them alone with problems during a session in the virtual lab our interactive tutoring component described in section 3 is implemented in VILAB. Analogue to traditional practical courses the learning content in VILAB used for our practical courses in distance is divided in several stations inside of the lab. There the students have access to several software tools, on which they work on their experiments and problems (section 4). The learner perspective is given in section 5. In section 6 we present our evaluation results and close with a conclusion about the kinds of support for learning we offer in VILAB.

¹ <http://pi7.fernuni-hagen.de/vilab/>

2 Working with VILAB

2.1. Architecture

VILAB is realised in a client-server architecture in which the Linux-based server is operated at the FernUniversität in Hagen (s. Fig 1). The server saves the content of the lab and manages the display of content via a navigation tool for the students. The server also harbours the tutoring component (section 3) and the software-tools and provides the communication infrastructure to databases and WebAssign². The access to the server is managed by decentral user clients (Windows- or Unix-based computers) which must be connected with the Internet. Via remote-login to the server the students are directly routed to a navigation tool which is one of the two user interfaces. After a login the server starts a new instance of the lab and the send/receive system of the tutoring component. Thereby the students cannot get access (intended or not) to the Linux-system of the server. For the display of the content of the lab the student has to open a browser on his client with an individual URL as second user interface. Via navigation tool local hypertext or PDF documents as well as documents out of the WWW can be selected by buttons. An action which shall lead to a display of a hypertext document result in an automatic reload in the browser of the user. This is realised by loading local documents in the individual directory of the user inside of VILAB and copying them to the URL of the user. PHP scripts inside of the hypertext document notice the change of the content in the user's URL and start the reload. In this way it is possible that actions on the server indirectly control the browser of the client. Documents of the WWW are embedded in a frame so that higher-level PHP-scripts can manage also the display of this kind of documents in the browser of the user. Via navigation tool the software-tools installed on the server can be activated. These tools can communicate via sockets with the tutoring component leading to the fact that every user have individual ports for this socket communication. Since every user possesses individual URLs, directories and ports inside of VILAB it is possible for the system to manage handling, saving, and display of data of many users at the same time.

2.2 User access

Realising the access to the learning environment to the students it is important to support the different client operating systems. The remote-login to the server of VILAB (via ssh to the navigation tool) is for students using Unix-like systems (e.g. Linux) trivial. Windows user have to install the open source packages *cygwin* and *xfree86.4.x* to get the analogous Unix functions needed for the access. The students can either download these packages from our web pages or ask for a CD produced at our institute and containing all needed software packages. Additionally, we demand for the client only a x86 processor and any standard browser (e.g. Netscape or Explorer).

The exclusive use of a browser environment seems to be simpler at the first glance, especially for the Windows user, but there are some large disadvantages. Since one of our main purposes is the integration of software tools to get practical experience, in this alternative variant we had to rewrite the tools as Java-Applet (in fact this is not possible due to the complexity of tools) or had to run the tools within commercial systems redirecting in- and output interfaces of the tools to a Java-Applet. On the other side the access to VILAB via ssh has the advantages that the reaction time of the tools is much smaller, all existing tools for Unix can easily be integrated in our learning environment, and we have large technical freedom for the realisation of our didactical concept. Offline working with a CD-ROM is out of discussion since some tools need the Internet access (communication with other systems), collaborative work would be excluded and access to databases for generation of adaptive feedback would not be possible. If students like to work offline they have also in the realised remote-login variant the possibility to download all text documents of VILAB.

² WebAssign is an established online system for standard exercises (e.g. multiple choice) with modules for automatical correction of such standard exercises. Additionally it allows the integration of further modules for the analysis of more complicated problems [2], [7]. This system is integrated in VILAB in such a way that users of the lab do not notice when they work with functions of WebAssign.

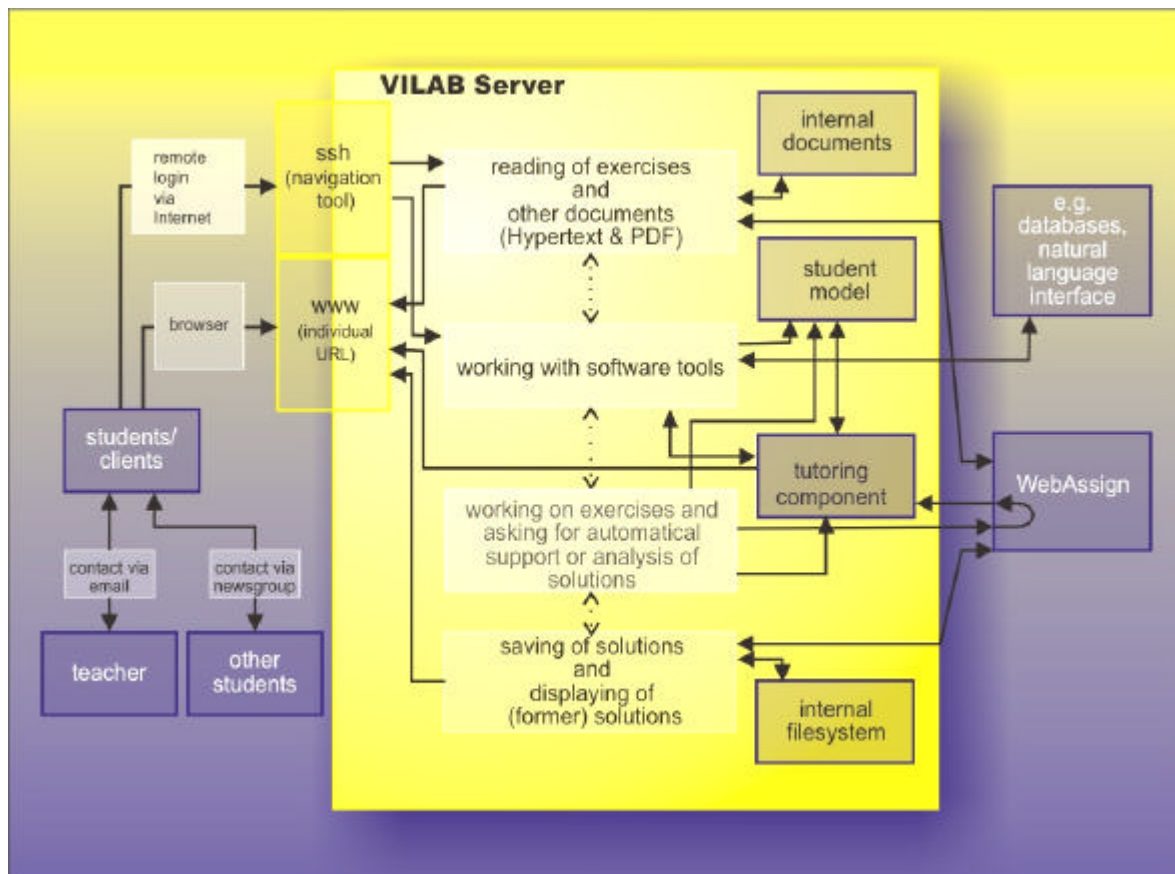


Fig. 1: Architecture and functionalities in VILAB

3 Tutoring component

While a student is working on an exercise or in a software tool, the send-receive system of the tutoring component has the functions of the error diagnosis and correction. Additionally, the tutor saves the student's result of an exercise, which was requested for correction, via the WebAssign system or the software tools. In this way the student starts every new editing of an exercise with his last result and a teacher has the possibility to examine results of the students. Depending on the learning target a possibly existing model result can be presented to the student. However, in most cases an analysis of the student's solution based on tests, comparison(s) with model solution(s), or methods using the artificial intelligence (e.g. rule based systems or inferences) is didactically better.

3.1 Error Diagnosis

Diagnosis means in this context the decision whether a solution is correct or not and to find out what and why something is wrong or incomplete. The tutoring component has an passive and an active error modus for two different kinds of problem solving support which are discussed in analyses of ITSs (Intelligent Tutoring Systems) [3]. In the passive modus ("intelligent analysis of student solutions") the send-receive system of the tutoring component has to identify errors from the student's final result after he has requested for a correction. This modus is needed for the non interactive (therefore the term "passive") programs (e.g. SQL, Java) in which errors are only detectable by a complete analysis of the student's input. This analysis is realised by correction modules and possibly following processes. The output of such an analysis integrating also an student model (Fig. 1) is an error code with accompanying parameters. The student model is based on data collected during the student's work in the laboratory and saved in a MySQL database. In the active modus ("interactive problem solving support") the send-receive system of the tutoring component does not wait for the student's final solution. If an interactive software tool detects an error, it sends at once the specific error code with accompanying parameters to the send-receive system of the tutoring component. Thereby the student is provided with intelligent help on each step of problem solving.

3.2 Error Correction

The error correction has the goal to show the student how to remove the errors asserted in the diagnosis by identification of missing or incorrect knowledge which is responsible for errors. The overriding goal of the tutor is the finding of the logical errors and not the complete listing of syntax errors as in standard program diagnosis systems. The error correction and the proposals for the problem solving are also embedded in the error codes and the accompanied parameters. These codes are processed by the send-receive system of the tutoring component with an error table. Every error code leads to the display of hypertext documents which are individually modified by Javascript variables extracted out of the parameters. The content of the documents includes several elements (not always all elements): a statement about the correctness of the solution, an error list, a description and explanation of possible errors, hints for improvement of solution and for the avoidance of errors, a listing of useful literature or lectures to derive lacking knowledge, example of similar exercises, possibly graphical information (in software-tools), an assessment of the student's performance, and a motivation [10]. In this way the students get adaptive feedback to their individual solution.

4 Practical courses with VILAB

Conception and platform are nearly independently developed from the teaching content. In this way new laboratory stations, which contain the content, can be added and further Unix-based software tools can easily be integrated. Currently there are five stations in the laboratory: Programming with the languages Java, C, Prolog, and Scheme (procedural, object orientated, functional, and logical), neuronal networks, relative databases, as rule based systems (semantic networks and natural language transformation in SQL), and computer linguistics. Every station has a main page giving information about purpose of the station, background, reference to other stations, and an overview about the exercises and software tools (e.g. request on databases, constructing neuronal networks with the SNNS³ [12], or transform natural language information in semantic networks using the graphic knowledge engineering tool MWR⁴ [4]) in the station. The exercises are divided in in learning targets, description of the task, relevance of the exercise for the field of knowledge, knowledge background for solving the exercise, helpful literature, description of the required software tools, characteristics of the solution, and kind of control/help by the tutoring component. The solutions can be standard tests (e.g. MC, numbers, correlations, etc.), free texts (programme code, SQL-queries, rules, etc.), or graphical solutions (e.g. networks created with the software tools).

In a practical course the students have to solve certain exercises of different stations in several month. How they reach the solution depends on themselves. The students can either read the given literature to the problems or get practical experience by free work with the software tools or directly work on the given exercises and problems with the interactive tutoring help. After the deadline for the work in VILAB is over the teacher controls with the help of the tutoring component the solutions and gives a final feedback. However, since the students know the comments of the automatic tutoring component they will almost know the final remarks of the teacher.

5 Learner perspective

During practical courses with VILAB students are supported in different ways depending on their kind of questions and problems. The access to VILAB is described in a manual (PDF) step by step. If there still exist problems students can write emails to the administrator. For the navigation inside the learning environment they can use also the help of the manual, however, the navigation is very simple so that in fact the students do not need help. Every exercise and its background is explained in detail (s. previous section) so that there is no misunderstanding. Nevertheless it is possible to ask the teacher

³ SNNS: Stuttgart Neuronal Network Simulator

⁴ MWR (MultiNet-Wissensrepräsentation) is a software tool for the graphic representation of MultiNet terms. In this graphic environment the terms can be produced, displayed, and manipulated. MultiNet (multilayered extended semantic networks) is a paradigm of knowledge representation created for knowledge processing and specially for the semantic representation of natural language information [6].

via email for more information. If students have not enough knowledge to solve an exercise there are links to literature in the system or in the WWW. For the use of the required software tools there are embedded manuals and FAQ lists. The format of the solutions of exercises is explained and examples given so that there is no problem to construct an adequate solution. A request of an analysis of a solution results in the immediate (few seconds) display of the feedback of the tutoring component (s. section 3). Wrong solutions lead to automatically produced and adaptive suggestions concerning the improvement of the solution:

- links to literature dealing with knowledge which seems to lack
- links to examples of similar exercises
- information about errors in the solution

Adopting these suggestions students can enhance their solution and resend it afterwards. Subsequent feedback (based on individual student models including the former feedback) is again the result. A few or a lot of steps of such an interaction are possible until the solution is correct. If students want to have other support than the interactive tutoring component is giving, they can use a special newsgroup to ask for help or send an email to the teacher of the practical course. The last two kinds of the communications can also be used for questions concerning functionalities inside of VILAB. However, since the students can only select between navigating, reading of exercises, working on them, opening of documents, working with software tools, asking for automatical analysis of solutions, and saving of solutions (Fig. 1) the functionalities are straightforward. Therefore there is no need for automatical help inside of VILAB regarding functionalities. The core of VILAB is its tutoring component for the analysis of exercises. Since its feedback includes all actions of the learning system which are possible it is assured that the students take full advantage of the options of the system.

6 Evaluation

The first use and the didactical testing took place in summer 2002 with concrete content of the field applied computer science. Since this summer term VILAB is used for teaching at the FernUniversität Hagen. However, VILAB is not only used in practical courses but also in seminars to deepen the students' knowledge about the individual themes (e.g. about themes correlated with software-tools, the software-tools themselves, elearning, or tutoring systems) and for self-assessment in addition to textual courses.

Results of evaluations (questions to students) show that the system works stable, the installation of the free software for Windows user and the access to VILAB is easy and the reaction times of the systems are very small (even with 56k modem). The students like the kind of learning with VILAB, since they have a lot of freedom. The design and navigation inside of the learning environment is "good" and functional. As supposed from the view of the students the interactive tutoring component was very important because of

- its help during the finding of the correct solution
- its motivation to find the right solution
- the possibility to learn with its fast automatic feedback

The tutoring component was so effective that newsgroup or email to the teacher of a practical course were almost not used. These communication methods were also not used because functionalities were not understood. From the view of the teacher the most important point is that the students have learned more compared to former courses without VILAB: The students' solutions of the exercises are very good. There are more students who finished their practical course successful. Self-assessment was connected with better results in examinations and working in VILAB resulted in better seminar talks. Additionally, a lot of students wanted to write their diploma thesis in the field of VILAB.

7 Conclusion

VILAB is an Internet-based learning environment training practical skills in computer science by working with complex software tools. The students get practical experience by the problem solving of different exercises and the help of an interactive tutoring component, which motivate them to search for the right solution of a given problem.

The students get different kind of support for learning by VILAB:

- Solving of problems is supported by the interactive tutoring component.
- The individual style of learning is supported because the way of learning is not determined. Reading of knowledge background, collecting practical experience, and solving of problems can be mixed and build many learning circles.
- Saving of knowledge is supported. Coached learning by doing on practical exercises leads to a transfer of theoretical knowledge into practice and strategies for solving of concrete problems. Together with the monitoring of the learning success this is more successful than pure reading of texts [9], [5], [1].
- The motivation of learning is supported by help and comments of the tutoring component.
- VILAB supports the access to software-tools and databases which otherwise they could not use from home (installation to complicated, no rights of use, tools need too much disk space, wrong operating system, etc.).
- The individual demand for self-determination is supported. Via Internet the students can work independently of space and time.

An integration of collaborative software tools with corresponding exercises and tutoring feedback in the future will also train the social skills during problem solving in groups. This training is a very important educational aim inside of practical courses since collaborative working is mostly used in companies.

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Authors :

Dr. Rainer Lütticke
Prof. Dr. Hermann Helbig
FernUniversität Hagen, Department of Computer Science,
Intelligent Information and Communication Systems
Universitätsstr. 1, 58084 Hagen, Germany
rainer.luetticke@fernuni-hagen.de

SUPPORT OF STUDENTS ON FACULTY OF INFORMATICS AND MANAGEMENT

Petra Poulová, Hana Šrámková & Miloslava Cerná, University of Hradec Králové

Introduction

Present society, sometimes called Information society, makes use of fast developing technologies in all layers of its existence. The area of education is no exception. Current educational process is influenced by numerous new trends and most of these trends are influenced by fast developing technologies. These advanced technologies find its role in many areas of educational process.

Firstly, it is necessary to point out the use of information technologies in the process of education, it means using various applications to make the education easier, e.g. word and spreadsheet, presentation and graphic programmes. Then Internet as the resource of plentiful information from all areas of human activities and consequently effective processing of the amount of information are worth mentioning. Information technologies play an essential role especially here in processing information.

The other part deals with applications, which provide direct education. These days we could include into this part various educational programmes, multimedia encyclopaedias, didactic computer games, applications for testing knowledge and skills. Educational applications can be run on-line on Internet or off-line.

Current educational trends are under the auspice of Internet technologies on the platform like WebCT, Blackboard, TopClass, Learning Space, Moodle, This virtual learning environment can be used both to support traditional face-to-face education, in the form of blended education and to make space for fully distance kind of education. Software companies try to meet the present trend and necessity of lifelong education in the society. These companies create new learning environment to make society change the way of thinking from traditional face-to-face training to a new kind of education - e-learning.

E-learning to a certain extent has become a fashionable matter. Anyway, advanced technologies provide a wide range of possibilities how to make the control of educational process more effective.

There are many ways how to use advanced technologies in various stages of educational process. A computer is not only a subject to be taught and learnt but it is now an educational tool to be used basically in all disciplines of knowledge. ICT can be used at many stages of educational process:

- Presentation of study materials
- Feedback activities (knowledge tests, assignments)
- Communication, starting social contacts
- Study process control

Particular stages of educational process can be supported in the following ways:

- WWW pages and communication via e-mail
- Multimedia educational programmes
- Virtual learning environment

E-learning at the Faculty of Informatics and Management

Alike most universities University Hradec Králové and especially Faculty of Informatics and Management has been using intensively e-learning courses for several years. First fully distance courses, which were formed in 1997, were based upon WWW pages. A tutor placed on them study materials, tasks or assignments. E-mail served as a means of communication.

In the following years the faculty started to use a virtual platform LearningSpace for distribution of e-learning courses. Later WebCT virtual environment replaced it and is currently being used. They both offer necessary and helpful tools and services to ensure e-learning courses of high quality.

In 1998 the first complex distance course for lifelong education was completed. It is a milestone, as this year development of e-learning course started.

Up to 2001 four e-learning courses were run (six terms with more than 100 participants). This year e-learning courses were opened for full time students.

Currently there are 59 e-subjects being used with undergraduate students of present studies, 79 e-subjects being prepared and are not completed yet, 16 e-subjects are being used in the programme of lifelong education.

E-subject is used in the form of fully distance subjects in 5% of all subjects, in the form of blended learning in 85% and as just a supportive tool of face-to-face education in 10% of all subjects.

The Faculty organizes a number of study specializations so it was necessary to prepare courses from various areas and of course in various ways. At our Faculty we prepare wide range of e-learning courses from fully distant application to just support of blended learning. Particular ways of use are described in the chapter “Case Studies of Chosen E-subjects” of this contribution.

Designed courses are evaluated from many points of view: economic, effectivity of study, creativity, etc. Among evaluated views there was attitude of students towards for them this new method of education and to what extension it is possible to implement e-learning into the process of education.

Students' Support Provided by Institution

Study-Guide

At the Faculty of Informatics and Management the students are involved in the following fields of study: Information Management, Applied Informatics, Financial Management, Sports Management and Travel and Tourism Management.

Transition from the secondary school to university seems to be very demanding from the student's point of view but faculty tries to make this move as smooth as possible. Students are supposed to both adapt to changes in the learning/teaching process and moreover to become responsible for organisation of their studies.

At the secondary school the students were used to being directly led by their teacher and were given prompt feedback; they knew their study results and achievements immediately.

Students who study at our faculty and participate in distance courses or in some e-subject based on blended learning are exposed too much higher demands as for self-discipline.

Due to above mentioned reasons an Introductory-motivating lecture is organised on regular basis for first-year students in the subject Psychology. During this lecture the students get acquainted with the organisation of their study, with information and other systems serving as a support to their studies and used by faculty management.

How to start with WebCT

The students' further preparation is directly linked to WebCT virtual learning environment.

As e-learning at the Faculty is primarily intended for students – e-subject users – it was necessary to make them familiar with WebCT.

At the beginning of each winter semester, there were held several seminars focused on the use of virtual learning environment for the interested students. All students can get ready for the new form of studying.

Moreover, there is a 10-minute sound presentation promoting the basic possibilities of the learning space on the Faculty Internet sites (<http://www.uhk.cz/oliva/student.html>) as well as 20-page instruction Student's Guide Through WebCT System for the students. The guide is available in print at the Service Centre of the Faculty of Informatics and Management, where students can buy it for the cost price.

The students are always informed on the relevant e-subjects by the tutor at the beginning of that particular course.

Improvement of computer literacy

Students from various secondary schools – vocational as well as grammar schools – come to study at our Faculty which prepares the graduates in information management, applied informatics, financial management, sports management and leisure management. It is clear that there are big differences in the level of computer skills among those students and thus, they may utilize information and communication technologies to different degrees when studying here. We spent quite a long time solving the problem of how to get different levels of students' achieved knowledge on one or at least on a comparable level.

Therefore we decided for a new model of the students' basic introduction into ICT.

In the first semester, all students take entrance exams in basics of ICT at the level of ECDL (European Computer Driving License) modules 1, 2, 3, 7. The students who already have or want to gain ECDL Start Certificate or ECDL Certificate need not take the entrance exams, but may prove their knowledge presenting the certificates. The students, whose knowledge and skills fall behind the defined standard, can attend a preliminary course with the aim to level the entrance knowledge in the subject. This course is organised by our faculty. But students can develop their skill otherwise.

The model proved to be efficient because the student's collectivity is more balanced knowledge wise and the problem solving in linked courses can reach more advanced level. In addition, the students are well prepared to exploit all opportunities offered by virtual learning space in on-line courses.

Case studies of chosen e-subjects

E-subject Analyses and Statistical Functions in Excel (ASE)

ASE is a subject that runs in the second year of winter semester. It ranks among optional subjects and was designed for all students who have passed a subject Applied Information Technologies. ASE is one out of three subjects being taught/learnt in a fully distance form.

Organization of Study

The semester is organised in the following way:

- Introductory meeting – Tutorial – at the beginning of the semester
Tutorial helps students to get to know a new style of studying, to get acquainted with a course and to agree upon common ways of communication
- Individual study of materials, practising learnt material, submitting assignments
- Work on a final project in Study Groups
- Final meeting with presentation of semester projects
- Ending the subject with a credit in case the student achieves sufficient score

Study materials

Students get to study materials directly in a learning environment.

The backbone is syllabus with all particular topics. In following parts the topics are worked out in detail and enriched with model examples and check questions to enable better practicing of learnt material.

Selftests and quizzes help to practise and fix the gained knowledge. After studying and practicing their knowledge the student works out an assignment and submits it to a tutor for checking. The tutor sets

an appointment with the student where he informs the student about reached score and gives a verbal evaluation with written list of mistakes. At the next stage the student works in a study group, formed at the beginning of semester, on the semester project.

Communication

Communication is based on three key communication tools.

- Mail – tool that is by students and tutor to communicate among one another
- Discussion – tool enabling communication within whole group of students or just within study group
- Chat- serves as consultation hours and runs once a week and lasts one hour

Support of Students

Students get acquainted with learning environment at the beginning of their studies at faculty meetings. At the beginning of each lesson is student provided with instructions how to study and approximate time necessary to that.

Feedback

Feedback between a tutor and a student goes via communication tools. Students can check gained knowledge through check questions, quizzes and selftests.

E-subject Database Systems 2 (DBS2)

The subject DBS is placed according to recommended study plan into the third year, winter semester. It is a compulsory subject designed for students of fields of studies Applied Informatics and Information Management. The subject is learnt in the form of blended learning where distance elements prevail.

Organization of Study

Learning process runs in the form of lectures and seminars. Attendance to lectures and seminars is not compulsory. Materials placed in the virtual placed can be used as a supportive means for preparation or if necessary they can come to the seminar to get a personal consultation. To finish the subject successfully students are supposed to work out and submit a final project and take part in an oral test.

Study Materials

Study materials are placed in WebCT, they include:

- Detailed syllabus
- Own study materials (materials fulfil the requirements set on content, lucidity and graphics, pre-defined icons facilitating orientation and making students active in self-study).
- Glossary of key words
- Dividing a final project into several stages with tasks (student submits particular part of their task to the tutor). Consequently the tutor sends his comments and evaluation of the submitted work
- Selftests

Communication

Two synchronic tools are used for communication - mail and discussion.

Support of Students

Students get acquainted with learning space at the beginning of their studies at faculty meetings (as mentioned above). At the beginning of the first lecture students are provided with detailed instructions about e-subject DBS2. The guide how to study the texts of lectures is placed in the virtual place.

Feedback

Feedback between a tutor and a students runs by means of communication tools and submitted assignments. A student can check his/her knowledge in selftests.

E –subject Professional English

Students at our Faculty of Informatics and Management study English language in 3 modules A,B,C for three years – six terms: beginners, intermediate and advanced. This on-line course was made for students of module B-intermediate that is based on English course “Business Objectives” comprising textbook, workbook and cassettes. It is currently being used as a supportive device of present studies. The course was also made to meet the demands of distance studies and involves targets of lessons, glossary, assignments, quizzes, tests and of-course keys and evaluation. This is the second course with improvements and innovations created after a detailed evaluation of the first one done by students, teaching assistants and teachers last year.

Organization of Study

Two lessons per week may be good enough to keep the already gained level of English.

Virtual studying space provides larger, creative and open space enabling further development of written skills, deeper practising grammar and lexicology where students can work at their own pace. This way more time can be devoted to practising listening and speaking during English lessons.

The semester is organised in the following way:

- Introductory meeting – Tutorial – at the beginning of the semester
The tutorial helps students to get to know the new style of studying, to get acquainted with the course and to agree upon common ways of communication.
- Students attend lessons and then work out given tasks in-line: like submitting assignments, completing quizzes and tests.
- When time for submitting the assignment expires a key to the translation is implemented into the content of the course so that students can check their knowledge. By means of the compile tool students can print or save the key and use it when necessary.
- Students will get a credit if they fill in all tasks from on-line course and successfully write three tests. Working in on-line course has proved to be helpful tool to succeed in tests.

Study materials

Each lesson consists of several parts. The first one is the entry with basic information: targets of the lesson, instructions where to find tests, quizzes, assignments, keys, explanations and presumed time for managing the material of the given lesson. The second part of the course is a list of key words and a translation as a kind of a correspondence task. Students are supposed to work out a translation exercise and submit it via an assignment tool. The translation exercise tests the student’s knowledge of grammar, key words, expressions and phrases relating to the given lesson. Selftests and quizzes help to practice and fix the gained knowledge. The key words are incorporated into translations and definitions.

Communication

Communication is based on two key communication tools.

- Mail – tool that is by students and tutor to communicate among one another
- Discussion

Support of Students

Students get acquainted with learning space at the beginning of their studies at faculty meetings. At the beginning of each lesson the student is provided with instructions how to study and approximate time necessary to that.

Students can use a helpful tool Glossary that includes key words from all lessons.

Feedback

Feedback between the tutor and the student goes via communication tools. Students can check reached knowledge through check questions, quizzes and selftests. Quizzes and selftests are evaluated automatically so students can get feedback and see their results and correct answers immediately. The

assignments are supposed to be worked out within about ten days. Then a teacher or his/her teaching assistants check them and send evaluation back to the virtual space.

Achieved Results

Since the aim of the research was to find out the attitude of students towards the new method of education, only students who had taken part in at least one subject run in virtual learning space were included into the research.

The research sample included students of two subjects taught/learnt with the e-learning support: “Database Systems” and “Analyses and Statistical Functions in Excel” which were designed and run by the authors of this contribution.

As for “Database Systems” 120 students of the second and third year of studies took part in the research. The other discussed subject “Analyses and Statistical Functions in Excel” was attended by 46 students of the second and fourth year of studies.

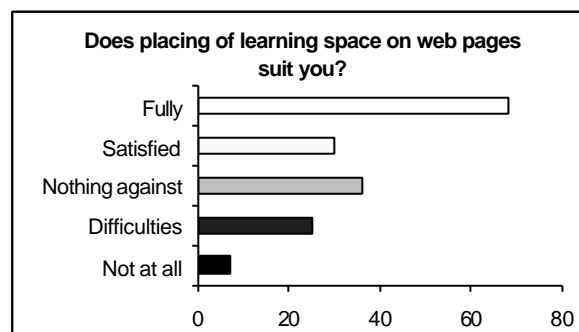
Information about the attitude of students was gained and collected by means of questionnaires, informal interviews at the beginning and in the course of semester and after passing the subject.

Students of both subjects answered the following questions at the end of semester:

- Does placing of learning space on web pages suit you?
- Was it convenient for you to submit your projects as Assessment?
- What did you like about virtual learning space WebCT? What do you have against?

Following graph shows the opinions of students of given courses on possibility to get to study materials in virtual learning environment WebCT.

The gained figures display that the students were generally satisfied with the use of virtual learning space for distribution of study materials. Less than 20% of students had some difficulties with this kind of getting new knowledge or it did not suit them at all. Nearly two-thirds students were positive about this way of study.



As virtual learning space encompasses a wide range of tools testing quality of study like selftests, assignments, quizzes that can provide students with a very good feedback, we supposed virtual learning space to be used rather for testing quality of study than mere source of information and knowledge.

34% students used the tool testing quality of study only a few times and 35% students used it once or more times a week. Students were satisfied with Assignment tool.

Students evaluated as positive in WebCT

- the possibility to study at any time, any place
- simple use, well ordered and comprehensive virtual learning environment
- good accessibility of materials
- possibility of submitting assignments and getting back evaluation, testing
- additional possibility of communication with teachers
- higher activity of students

Students evaluated as negative

- English command of virtual learning environment
- badly ordered and difficult virtual learning environment or e-subjects
- impersonal contact
- higher costs of the Internet connection
- necessity to follow changes in virtual learning environment (students would prefer sending external e-mail or SMS)

Thanks to systematic preparation of students for e-learning we managed to gain really good results when making and implementing e-subjects into university education.

Authors:

RNDr. Petra Poulová, Ing. Hana Šrámková, Mgr. Miloslava Cerná
Faculty of Informatics and Management
University of Hradec Králové
V. Nejedlého 573
Hradec Králové, 500 03
Petra.Poulova@uhk.cz
Hana.Sramkova@uhk.cz, Miloslava.Cerna@uhk.cz

THE IMPULS^{EC} COLLABORATIVE KNOWLEDGE PORTAL¹ – INTEGRATION OF E-LEARNING COMMUNITIES FOR EFFICIENT LEARNER SUPPORT

Jörg Sandrock & Christof Weinhardt, University of Karlsruhe

Introduction

The maturity of Internet and software technology and the development of didactic concepts for E-Learning content and online education have contributed significantly to the emerging use of E-Learning products and services in both corporate and academic training in recent years. Internet technology supports an almost global distribution of E-Learning content. Ubiquitous information and communication technologies for distant learners and tutors promise immediate or delayed help when needed. Although up-front developments for E-Learning content and technical platforms are very resource-intensive, economies of scale achieved with content reusability and cost advantages for online education make up for these burdens.

The use of Internet technology jeopardises traditional value chains² and determines organisation and structure of the economic value-creation. It also shapes the traditionally highly integrated education sector, where typically single institutes or persons create, develop, present, tutor, and market their content and courses [4]. Far from it, the E-Learning industry is characterised by smaller, specialised organisational units connected with each other, forming new alliances and networks and deconstructing the value chain [6].

Internet technology also provides the opportunity to form virtual or online communities. The term *virtual communities* was coined by Rheingold [9] who describes them as ‘*social aggregations that emerge from the Net when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace*’. Preece [10] characterises virtual communities as (a) people, who want to interact socially, to satisfy needs, perform roles etc.; (b) a shared purpose that provides a reason for the community; (c) policies that guide people's interaction; (d) computer systems, to support and mediate social interaction.

Learners benefit from virtual communities in multiple ways. Studies show that virtual communities support the process of knowledge construction [11], increase learner satisfaction, and enable social and mutual learner support [7]³. Hence tutoring and mentoring efforts and costs are likely to be reduced. Therefore most online universities trigger the emergence of virtual learner communities and offer the necessary communication infrastructure. Unfortunately, due to the early stage of several online university projects at least in Germany, relatively small numbers of subscribed students limit the size and the value of the virtual learning community. However, due to E-Learning content reusability and the deconstructed E-Learning value chain, identical or only marginal modified courses from the same content providers are offered and used from different online universities or other training providers. This gives the opportunity to integrate content specific *inter-university* virtual communities.

¹ Impuls^{EC} (Interdisciplinary Multimedia Program for University Education and Self-Organised Learning: Electronic Commerce) is an interdisciplinary E-Learning project of six German universities. The project is funded for three years by the German Federal Ministry of Education and Research (*BMBWF*). Goal of the project is the development a modular, multimedia curriculum in electronic commerce delivered via the Internet. The learning process is inspired and conducted under the concepts and principles of *problem based learning*. The project also provides a knowledge portal as well as a content creation and authoring environment. For further information, see [3]

² According to Porter [8] a value chain can be understood as a “*collection of activities that are performed to design, produce, market, deliver, and support*” products and services.

³ See [7] first paragraph including there quoted literature.

This paper proposes the concept of a collaborative knowledge portal for seamless integration of different E-Learning communities from different online universities providing identical or similar courses. The integration of formerly disjoint virtual learning communities increases size and potential of *low-cost* learner self support and provides a cost-effective solution for tutoring and mentoring. The paper is structured as follows: the first section gives an overview on E-Learning infrastructure products and content. Thereafter, functions and features of the collaborative knowledge portal are described and the integration architecture is depicted. The paper concludes with a discussion of the next steps.

E-Learning products

For the following proposal it is helpful to understand some basic features of E-Learning infrastructure products and content, the nature of E-Learning services and the characteristics of the E-Learning market. Typically, online universities or other online training providers rely on integrated or several stand-alone software solutions and applications to host E-Learning content developed in-house or acquired by third parties. Furthermore, online universities also run communication applications for learner tutoring and mentoring.

E-Learning infrastructure

Online and distance education platforms can generally be categorized as follows: (a) learning content management systems, (b) learning management systems and (c) communication and collaboration systems [5]. Although all these technology components need not be in place in order to provide online learning, some features of these components will most likely be present.

- Learning Content Management Systems (LCMS) are platforms where developers can create, store, reuse, manage and deliver learning content from a central object repository, usually a database. E-Learning content in LCMS is typically stored in XML format allowing separating content from presentation. This assures the reuse of E-Learning content in different formats, platforms and devices.
- Learning Management Systems (LMS) automate the administration of the web presence, manage the log-in of registered users, manage course catalogues, record data from learners, and provide reports to management.
- Communications and collaboration systems (CCS) enable synchronous and asynchronous communication between learners and tutors. Communication tools such as chat, email, bulletin boards, link exchanges or video conferencing are integrated in the web site.

LMS and LCMS are not necessarily separated systems and integrated suite solutions (also labelled as *learning environments*) are available. However, it is important to observe that learning management systems typically include communication and collaboration tools when marketed.

E-Learning content

E-Learning content is typically available in certain, specified modules that allow the reusability of learning objects. Successful standards and specifications such as U.S. Government's *SCORM* (Sharable Courseware Object Reference Model [1]) ensure that learning objects can be easily merged with other compliant elements to produce a highly modular repository of training material. Furthermore, standardisation ensures that E-Learning content can relatively easily be transferred from one learning infrastructure product to another. This allows modifying and creating content by different LCMS, enables the accessibility in compliant LMS and provides the interoperability with a variety of communication and collaboration tools. Accordingly, E-Learning content providers have the possibility to market and distribute their products to corporate or institutional customers almost on a global scale. In some cases, content providers also tutor and examine the online and distant learners.

Features and system architecture of the Impuls^{EC} collaborative knowledge portal

This section presents examples for collaboration tools and features available on the Impuls^{EC} collaborative knowledge portal and describes the architecture and how the portal features interact and work within different learning environments of various training and E-Learning providers. It illustrates the system operation, relevant system components and what information is exchanged among the components.

Functions and Features

According to Bach [2] a knowledge portal consists of structured content and functions plus user interface and navigation to provide users with the information and functions they require via a uniform, web-based interface. E-Learning knowledge portals support both learners and tutors in the education process.

Structured Content

The Impuls^{EC} portal provides a structured collection of hyperlinks and content specific multi-media information accessible over the Internet. At the content level, the available information can be structured in primary, supplementary and personal information (Table 1).

Table 1 Sample Content of the Knowledge Portal

Primary	Supplementary	Personal
<ul style="list-style-type: none"> ▪ Glossary of terms ▪ Frequently asked questions ▪ Course literature and Internet resources ▪ Administrative help & contact information 	<ul style="list-style-type: none"> ▪ Newsletter ▪ Games (e.g. question of the day) ▪ Job exchange ▪ Relevant news ▪ Guided Tour 	<ul style="list-style-type: none"> ▪ Personal information including short CV and picture ▪ Preferences

Primary information is directly related to the content of the E-Learning course. Supplementary information increases the attractiveness of the knowledge portal offering a range of additional subjects such as business news or general instruction on the platform. Personal information contains the learners' customisation information, preferences and profiles. Learners can for instance easily develop their own homepage in the knowledge portal, create and edit individual newsletters, or store and exchange course specific hyperlinks.

Communication and Collaboration Functions

The Impuls^{EC} knowledge portal provides various tools for communication and collaboration. These include both *push* (e.g. newsletter) and *pull* (e.g. search function) information. Table 2 gives an overview of communication and collaboration functionalities. (See also [2] for further information)

Table 2 Communication and collaboration functions

Functions	
<ul style="list-style-type: none"> ▪ Search function ▪ e-mail ▪ Message Boards ▪ Discussion Groups ▪ Document Sharing ▪ Newsletter 	<ul style="list-style-type: none"> ▪ Chat Rooms ▪ Find Experts ▪ Video Conferencing ▪ Audio Conferencing ▪ Meeting Planner

Interface and Navigation

Learners exploit E-Learning content and communication and collaborative functions through a web interface. Structure and navigation elements of the knowledge portal allow customising content to suit individual user and group requirement. This supports an uncomplicated and intuitive web access.

System Architecture

This section describes the collaboration concept, the technical framework and integration concept for the collaborative knowledge portal. The portal interacts and partly replaces collaborative functions integrated in learning management systems (p.456), and may be used by different online universities or other training providers, following the concepts of content modularisation and reusability (p.456).

Collaboration Concept

The Impuls^{EC} architecture enables learners from various online universities to access the collaborative knowledge portal *indirectly*, i.e. via their online universities. Whenever learners use collaborative applications usually provided by an online university (p.457), the online university routes that request to the portal (Figure 1). The portal provides an instance of this application (e.g. chats or online glossary) rendered in the online universities' layouts. Learners can access these applications through the university web site and from learners' perspective it seems that applications and tutoring are provided by the online university. Learners from different universities hence work virtually on the same system and thereby form one E-Learning community.

The underlying technical integration is described in the following section.

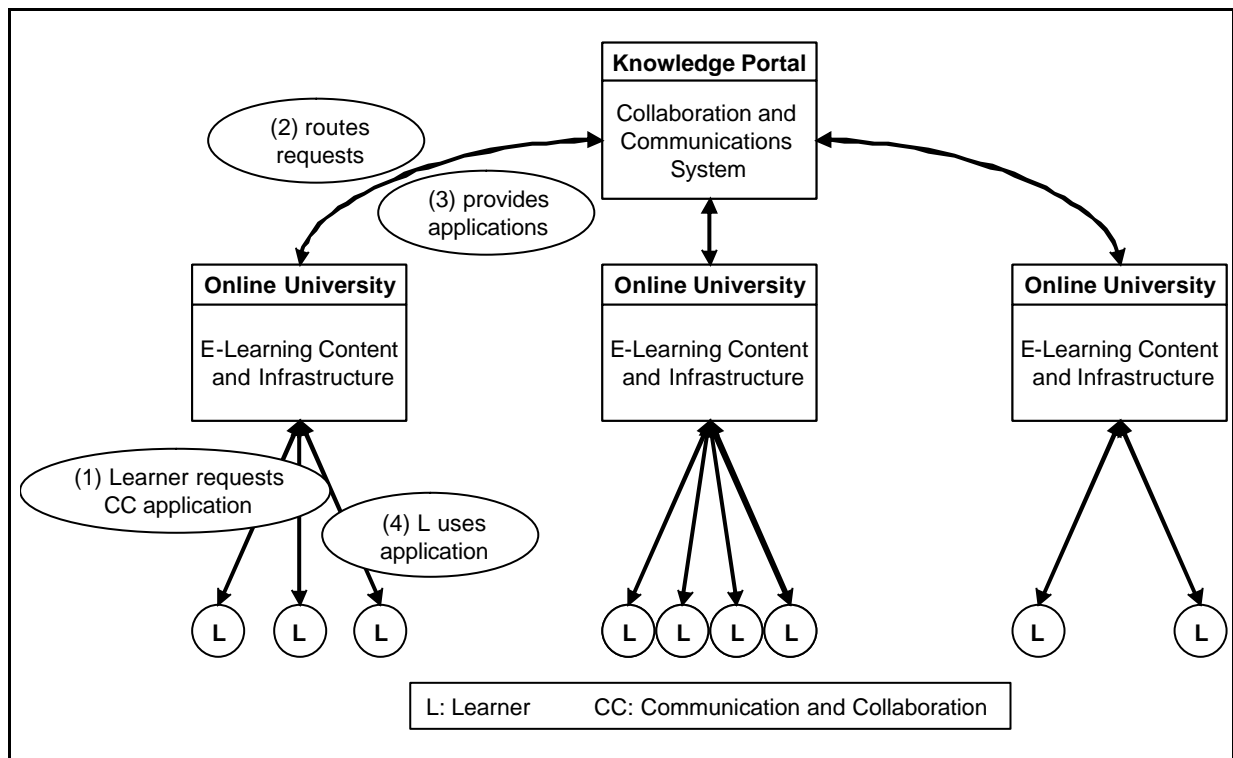


Figure 1 Knowledge Portal Collaboration Concept for One E-Learning Community

Technical Framework

The Impuls^{EC} portal is based on the *Microsoft .NET* framework, written in *C#* and runs on the *Microsoft IIS* web and *Microsoft SQL* server. Based on this framework, Microsoft provides freely a comprehensive sample portal application including the source code as a starting point for the development of own applications and reducing development time and cost. These include for instance online administration tools for role-based management of security and access rights to portal content and applications. Furthermore, the framework supports the clean separation of code and content. However, the Impuls^{EC} portal provides various additional communication and administration functionality and is a major enhancement to the original application.

Most important, the framework provides a native support for industry integration standards including XML and web services. Web services are most suitable to combine loosely coupled applications and to share data and functionality over a network such as the Internet. Based on standard protocols such as XML, SOAP, and HTTP, web services are operating system and programming language agnostic and can thereby efficiently integrate technical heterogeneous and disparate environments [12].

Integration Concept

The Impuls^{EC} portal uses web services for the communication between the different online university systems and the portal. A web service evokes an instance of a collaborative application to serve the requested communication demand; the instance runs at the portal site. Data (for instance chat dialogues or email messages) is stored in a central data base at also the portal site.

Two relevant issues concern the integration of the portal with the infrastructure of online universities: (a) to maintain the original design and web site layout of the online university (*white labelling*) and (b) to provide single sign-on functionality for the learners.

Both functionalities seem essential for the acceptance of online training providers to integrate the portal into their existing infrastructure and thereby enable the integration of different E-Learning communities.

- Original design: the separation of content, layout and code in the .NET framework allows easy rendering of applications independent from their content. Therefore, online universities define style files in their specific design. Whenever a learner authorised at the online university accesses a collaborative application, the online university requests this application from the portal site. A web service exchanges the necessary information: essentially the IP address of the requesting university and the type of requested application. The portal then matches this information and applies relevant style files when delivering the application. Learners will not notice that they actually access a different site.
- Single sign-on: to avoid multiple passwords and other learners' inconvenience, the portal provides single sign-on functionality. Learners typically have to login at their online university web site to start online training and tutoring. When learners access a collaboration application, a web service sends the unique learner identifier (e.g. the registration number) and ID of the university to the collaborative knowledge portal (Figure 2). The combination of both is hence unique to the system and learners are identified. At their first login, however, learners are asked to create their profile at the portal site which might appear to be a redundancy from the learners' point of view.

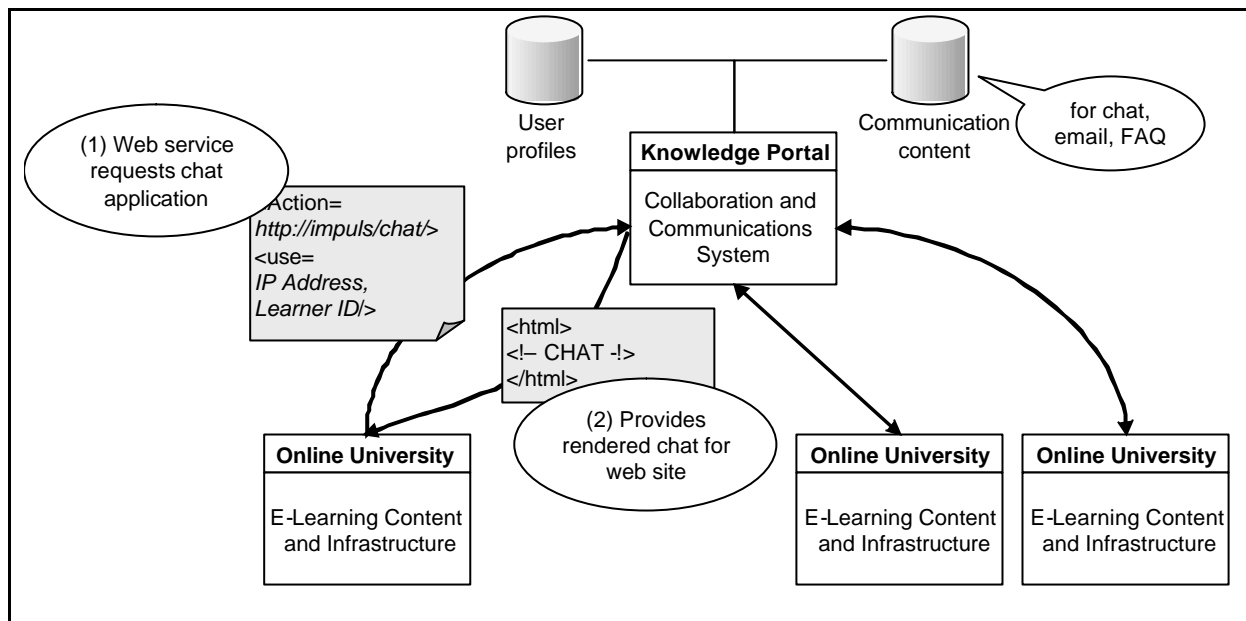


Figure 2: Integration Architecture

Conclusion and next steps

This paper describes a functional and technical concept of a collaborative knowledge portal to integrate different E-Learning communities from different online universities around identical or similar E-Learning courses. The E-Learning content reusability and the current limited size of E-Learning communities encourages implementing this collaborative knowledge portal. Potential benefits are increasing learner self support, more efficient tutoring and mentoring and thereby reduced training and mentoring costs.

Next steps are to prototype and test the technical infrastructure and to evaluate benefits and costs of the portal application. Furthermore, the acceptance of learners and other interested parties without an online university access should be considered, since benefits for increase self-support might balance the drawback of potential higher administration and tutoring efforts. Therefore, beside administration and operation issues, the technical roadmap might include a different login and security process.

Content providers, which also offer tutoring and mentoring services, are most likely to run such proposed collaborative knowledge portal. But also content exchange (e.g. the IMC's Corporate Content Exchange or the ELENA-Project) are well-positioned to provide a collaborative knowledge portal.

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Authors

Jörg Sandrock,
Prof. Dr. Christof Weinhardt
Information Management and Systems
University of Karlsruhe
Englerstr. 14
D-76131 Karlsruhe
joerg.sandrock@iw.uni-karlsruhe.de

SUPPORTING STUDENTS BY TELEPHONE: A TECHNOLOGY FOR THE FUTURE OF STUDENT SUPPORT?

Anne Gaskell & Roger Mills, *The Open University UK*

Introduction

Is the telephone a neglected technology in open and distance learning? Telephones are still used an enormous amount by both students and their tutors but have only recently become again the subject of critical analysis and research, mainly in the context of mobile phones and 'mLearning' (Keegan 2002). Maybe this is to be expected; they have become so integral to the ways in which tutors and students interact with each other and with their institution, that nothing more needs to be said.

Of course it is the case that not all distance students have access to land line telephone systems, nor on a regular basis to the use of mobile phones. As Kofi Annan said: 'A quarter of all countries have not yet achieved even a basic level of access to telecommunications -- a teledensity of 1, or 1 telephone for every 100 people. Half the world's people have never made or received a telephone call' (Annan 1999).

Recently on-line communication has attracted most researchers and distance education commentators. But the use of mobile phones is extensive and its application for student support has attracted increasing interest and research and has been the subject of EU funding.

We suggest it is worth pausing to review current research and reflect on whether there is more to learn about institutional and tutor-student interaction using the telephone rather than just assume that most interaction for the future will be on-line, whether synchronous or asynchronous.

Early research

The very first edition of *Teaching at a distance* (1974), the precursor of *Open Learning*, included two articles on teaching by telephone: one by John Short *Teaching by Telephone: The problems of teaching without the visual channel* (Short 1974); and one of a more practical nature by Odette L'Henry-Evans *Teaching by Telephone: some practical observations* (L'Henry-Evans 1974). Even before that time, Rao and Hicks reported from a very small scale project in North America that 'students learn as much or more in telephone conversations as in face-to-face situations' (Rao and Hicks 1972).

Three years later, in 1977, Ben Turok, then a Senior Counsellor in the London region of the Open University (and incidentally now an ANC member of parliament in South Africa) contributed to the debate in an article *Telephony - a passing lunacy or a genuine innovation?* Turok was very clear. 'There can be little doubt that correspondence is the best vehicle for degree level distance study' (Turok 1977). However, he goes on to explore the weaknesses of purely correspondence teaching pointing out the lack of synchronous interaction. Turok quotes research evidence from Sweden that 77% of students found telephone teaching 'very helpful'; and Davies (1976) at the University of Linköping also in Sweden, who had used individual telephone calls to teach English at a distance and reported that 91% of students gave telephone teaching the highest rating on a 5 point scale. He added that 'there is little doubt, especially in the case of more reserved or weaker students, that they speak more connected English in the course of these telephone conversations than they would in many hours of normal so called 'contact' teaching where they are always members of a larger group' (Davies 1976).

Throughout the 1970s, 80s and early 90s, despite difficulties with inadequate technology, both in terms of connections and in terms of the quality of the actual telephones, a significant amount of teaching and student support by telephone took place across the world. Despite the amount of attention paid to on-line learning with its lack of both aural and visual cues, there is still a vast amount of

telephone interaction, with a solely aural channel, which attracts very little research except in the context of mobile phones which have particular limitations. And despite some early training materials for tutors on making best use of the telephone and chapters in developmental materials, it is only in 2003 that the Open University UK has produced an Open Teaching Toolkit for its part-time staff on *Supporting Students by Telephone* (Gaskell et al 2003) – two years after a similar Toolkit on CMC (Computer mediated communication) was made available.

The rest of this paper reviews some recent research which analyses the way in which institutions and students use the phone to support students in their studies and then moves on to consider the value of the mobile phone with its text messaging facilities for student support, both in the developed world and in those countries with very few resources.

Student support by telephone

It is useful to differentiate between four broad types of telephone support and tuition, in addition to reactive contact between institution and individual student:

- Proactive contact between institutions and individual student
- Proactive contact between tutor and individual student
- Responsive contact between tutor and individual student
- Planned ‘tutorials’ by phone, whether with a group or an individual

It is also important to take into account the individual nature of the contact in the latter three types which in itself may be a major factor in students’ appreciation of this activity.

Indeed it could be argued that individual support and contact, whether on-line, by correspondence or by telephone is the essence of effective support in distance education. Individual support is also, of course, more costly.

Proactive contact from the Institution: retention issues

Recent research within the Open University and elsewhere has demonstrated the importance of telephone contact in student induction, retention and performance on course. Since Tinto wrote about ‘institutional departure’ in 1993 (Tinto 1993), ‘integration’ into the institution, in both social and academic terms, has been recognised as a key element in student retention. Contact by telephone seems to be particularly effective in aiding this integration in ODL. Simpson reports on a project in which 800 students new to the Open University were contacted by telephone early in the year with an offer of support and encouragement. A later check on the students’ progress halfway through the course indicated that the retention rate for these students was 4.5% higher than for a control group of students who were not contacted (Simpson 2003a). Pre-course telephone contact to those who have reserved a place on a course has also had a significant impact on student recruitment: the conversion rate from reservation to full registration on a course was 5.4% higher for those who were contacted than for those who were not contacted. The Open University UK has now developed a national strategy for the recruitment and retention of students which will involve telephone contact at six key points in a student’s year.

Similar findings have been reported from elsewhere: Simpson cites Case and Elliott’s study of Rio Salado College in Arizona (1997) in which ‘between two and five calls were made to targeted students starting within two weeks of the course start...they found that between two and five calls were most effective and that students receiving that number of calls were 15-20 % more likely to be retained’ (Simpson 2003a). Ohio State University used ‘telecounsellors’ to make proactive contact with enquirers and students and build positive relationships through one-to-one dialogues and reported a 4% increase in retention between targeted and control groups of about 8000 students each (Mager 2003).

Proactive contact from the tutor

Research in the Open University UK indicates that students prefer to be contacted by their tutor when this is possible and Gibbs reports on the significant impact early contact from a student's own tutor can have (Gibbs 2002). In a survey of 2638 OU UK students, 1346 received contact from their tutor before their first assignment as a matter of University policy rather than by chance or as a matter of choice. The results were that students contacted by their tutors were more likely to submit the first assignment and more likely to receive higher grades. Telephone contact was also more likely to be perceived as encouraging when compared with letters, emails or computer conferencing and so seems to be the most effective medium for this initial support.

Responsive contact from the tutor

One of the early issues discussed in relation to telephone contact was difficulties encountered by lack of visual cues. Since then CMC, in particular email, has become a very common means of communication which shares the lack of a visual dimension and also lacks an aural dimension. It is of interest, then to compare ways in which students and tutors interact when these two media are both available. Kaye (2002) discusses a project from the OU UK's Cambridge centre in which tutors were asked to compare their own and their students' use of phone and email as two 'distance' methods of communication over six months and then join a focus group to discuss issues that arose. Tutors generally agreed that the phone was a particularly appropriate medium for dealing with difficulties over course content and for engaging in a dialogue. Tutors reported both pedagogical and practical benefits of using the phone, although phone calls tended to take longer: 'By phone you can throw out questions – there's much less of you telling them the answers'; 'What can be covered in a single phone call can extend over several emails' (Kaye 2002).

Planned 'tutorials' over the phone

The Open University in the UK is increasingly using telephone tutorials to support students on relatively low population courses which draw from a large geographical area and has used them for many years for students who are remotely located, for instance in the Scottish islands. Many of these use a version of conference calling and have been highly valued by students.

More recently the Open University has introduced level 1 Access courses – the Openings programme (http://www3.open.ac.uk/widening-participation/p4_1.asp) – which are supported entirely by telephone. Students are allocated to a tutor who phones and negotiates dates for telephone tutorials and the submission of assignments. The programme has been very successful in a number of ways: by attracting students who might not otherwise have studied at Higher Education level; encouraging students to continue with degree level work by registering for an undergraduate course; successfully complete their first year in an undergraduate programme; and register for a further course the following year. There was, for instance, a 10% difference between numbers of Openings students and other new students who continued to register when they had completed their first 'conventional' OU level 1 course. 90% of Openings students surveyed in 2001 felt that telephone contact was sufficient as the main source of support; it also seems to have been perceived as particularly helpful in enhancing confidence before undertaking a conventional OU undergraduate course with face-to-face tutorials: 'I can now meet other students at the tutorial. I don't think that I was ready for that when I was doing Openings' (Allen & Sutton 2001). This confirms the findings from earlier research from the Open College in Canada, where Norquay (1986) reports that a large number are held back 'by low self-esteem. Open College students can test their abilities in private. By the time they go to a study weekend to mingle with other students, they have had feedback from their tutors and their confidence has begun to build'.

A current research project (Curry et al 2003) is investigating (among other issues) the role that telephonic communication can play in helping inexperienced students become familiar with the academic discourse and conventions of their chosen subject and develop proficiency in 'academic literacy'. The provision of a series of tutorials allows tutors to introduce academic concepts gradually. One tutor reports that his approach is to 'start off very informally, sort of ordinary discourse and move towards academic discourse slowly and incrementally'.

The development of academic discourse at a distance in mathematical subjects can be particularly well handled by phone if the tutor is aware of the potential difficulties. In the UK, for instance, many new students are unfamiliar with Greek characters used in mathematical notation (eg \mathbf{l} , \mathbf{q}) and need help in developing expertise in referring to them correctly (Gaskell et al 2003).

New technology and telephonic communication: mobile phones

Technological changes are very rapid and impact on different countries in different ways, so while there have been huge developments in various telephone conferencing systems, we will look here at the educational potential of the increasingly common mobile phone.

The number of mobile phones around the world now exceeds 1.25 billion – a global penetration rate of more than 20%. Some European countries have now reached market saturation: Luxembourg, for example, had a penetration rate of more than 110% at the end of 2002; and the UK was high on the list with 83% (New Statesman 2003). The EU Leonardo da Vinci programme supported a project on the use of mobiles in educational contexts (Keegan 2002).

Mobile phones can already provide access to the internet and email. In the (possibly near) future it looks likely that mobile phones will be able to provide opportunities for telephone conferencing with a visual channel and so remove one of the initial difficulties associated with telephone support.

In countries with a good landline phone infrastructure, mobile phones can be relatively expensive to use, but they can also provide a vital medium for contact between student, tutor and institution.

It is in developing countries that the potential for the use of mobile phones in an educational context is of critical importance. Recent research from the University of Pretoria shows that, of 1,900 students enrolled on a distance education programme only 0.4% had access to email, while 99% had access to cell/mobile phones and so text messages could be used effectively (Viljoen 2003, Brown forthcoming 2004). The fastest growing markets for mobile phones are in Africa, the Middle East and parts of eastern Europe. The Nigerian market, for instance, grew by 369% in 2002 (New Statesman 2003).

Text messaging

In September 2002, mobile phone users in the UK sent an average of two million text messages per hour (Guardian Newspaper 22 October 2002, cited in Simpson, 2003a). It is also clear that it is younger people who are the main users of text messaging. In Finland in the early 1990s, for example, mobile phones were seen as the ‘preserve of the professional classes...and known as the “yuppie bear”’. As mobile phones spread from the professional classes to youth culture, Finnish teenagers began to refer to the device as *kanny*, a Nokia trademark that means ‘an extension of the hand’ (New Statesman 2003).

Research from the OU, the University of Pretoria and the Leonardo project indicates some of the ways in which textmessaging can best be used for student support in the context of Open and Distance Learning. These include reminders about time-sensitive events, for example, the content and timing of assignments and tutorials; information about additional resources or events (for instance a lunar eclipse for an OU UK astronomy course, or a relevant television programme); flagging current concerns which may need response in a different medium (‘I am struggling please phone’- OU UK). The University of Pretoria used bulk messaging to provide basic administrative support and Brown (forthcoming 2004) reports some major successes: in response to a reminder for registration, 58% registered before the closing date compared to the normal expectation of below 40%. He concludes that ‘m-learning is the gateway to e-learning for most learners in Africa as the rapidly growing wireless infrastructure increasingly fulfils their access needs’. It is clear however, that textmessaging alone may be of limited use in providing some kinds of student support, for instance detailed academic discussions or reassurance whether cognitive or affective. The OU project concludes that, given the current student and tutor profile, text messaging may be most appropriate for centralised reminders rather than for individualised tutor-student exchanges which may be more effectively handled in other media (Simpson 2003b). However, this is a less realistic option in other parts of the world.

Telephone support: implications of current research

The research cited above indicates that telephones have a major role to play in student support and are indeed the best medium to choose for student contact on many occasions. Evidence from this research indicates that

- The key area for developing student support is in countries with a high level of access to mobile phones and low access to computers
- Textmessaging can be very important in some contexts but has limitations in terms of extended student support
- Rapid advances in technology will enhance the use of telephones for support in the future
- Proactive contact with students at an early stage has a significant impact on student integration and retention
- Students may find telephone communications more encouraging than other media, such as email, letter or computer conference
- Telephone conversations provides a real opportunity for a dialogue with students and to develop students' academic discourse
- Mixed use of media can provide the most helpful source of support, depending on the nature of the contact and the individual student; tutors may need staff development to develop their professional expertise in this area

Questions for discussion

The research also raises a range of issues for further investigation and discussion at the conference:

- Is proactive contact by telephone from the institution or tutor more or less powerful than contact by email?
- How much group telephone tuition is taking place across Europe/the world? Has it been mainly superseded by synchronous and asynchronous online activity?
- Do students and tutors need to be trained to use the telephone? Or is it just a matter of common sense?
- Which institutions proactively contact students in danger of dropping out?
- Is there much use of systems which combine the visual and aural/oral channels such as the OU UK's Lyceum system?
- What role do mobile phones have in the future in countries with a good landline infrastructure?

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Authors

Anne Gaskell and Roger Mills
The Open University in the East of England
a.f.gaskell@open.ac.uk ; a.r.mills@open.ac.uk

SUPPORTING THE wEak-LEARNER IN E-LEARNING CULTURES

Jan Gejel, The Social and Health Care School Aarhus

A personal approach...

This is not a scientific paper. It is more like a personal approach to some very complex problems: how to deal with the fact, that a very large part of the European population have no wish at all to reenter the fields of (e-)learning.

The suggestions presented in this paper are very much based on the inspiration from the work of Seymour Papert, MIT Media Lab US, and from the global youth inclusion project *Computer Clubhouse Network*, launched by MIT Media Lab some ten years ago.

Lifelong learning for *everybody*?

We all know the visions about lifelong learning and about the information society for *all*. We have now come to a point, where we pose the question about the *quality* of e-learning. Just like we pose the question of the *quality of life*. We do that because these qualities are not self-evident.

In the next couple of years we will experience some serious problems about the quality of e-learning in relation to large groups of the population. It is a group *we* would like to *include* in the information society, which means that *we* would like to get *them* engaged in lifelong learning.

This very large group of the European population consists of people from 15 to 70 years of age with poor educational backgrounds, dropout problems, negative school experience and resistance against or inability to work with informational knowledge.

We use several names for different parts of this population: the low educated, the excluded, the dropouts, the underserved and so on. What characterizes the group as a whole might be *the lack of personal learning competencies and the lack of interest in learning*. They could, from *our* point of view, be called *weak learners*.

Now this group is very complex: young drug addicts, midaged busdrivers, unemployed immigrants and a lot of people suffering from negative classroom experience. The important thing here to reflect on is the mental model, that defines what *learning weakness is all about* – and thus what learning is all about.

It is quite easy to see, that the mental model, responsible for these judgements, is the classic formal knowledge model: knowledge is about abstract thinking and the ability to synthesize the elements of experience into the abstract language of theory.

In fact the apparent lack of a interest in learning is perhaps a consequence of a number of original abstract knowledge judgements based on the classroom model.

Let us, then, try to describe this *weak learner* in general – knowing that they are of course very different indeed.

The “weak” learner

The most important statement about these “nonlearners” might be, that they think and act in spoken language, that this language is based on a narrative discourse and that the point of views are personal and subjective.

These learners avoid the written language and the abstract, formal scientific and objective discourse, that is the ideal of the modern educational model.

When they share their experience with other people, they prefer to talk about them face to face and they communicate the content in the form of telling stories – very personal stories and very realistic stories.

They do not – as does the academic – synthesize the experience to some abstract structure of objective and general value. And they certainly do not write a paper about this experience.

As you can see – this learning or mental style is not exactly what e-learning is about. But these spoken language competencies are extremely important, when you as a social worker meet an alcoholic in his home during a crisis. Because the alcoholic tells stories as well – the alcoholic *is* a story...

The resistance against abstract thinking is not a conscious choice. It is a result of a lifetime – and a result of a rendez vous with a classroom, that resulted in a lack of self-esteem, in anxiety, learning blockages and even social hatred.

The cultures of ICT and e-learning

Now let us on the other hand try to describe the cultures of computerbased learning.

Working with computers is in itself a very abstract process – regardless of the content of the work being done. No matter how creative the content of the work might be, computer work is a uniform and very limited form of activity based on a very limited use of the person as a whole. So computerwork as a *form* looks more like studying books, than driving a bus or talking to an alcoholic.

And even the content processes are abstract: they demand a very high form of formal logic, obeying rules and working in concise, metaphorical structures. Apart from a few illustrations, often just being produced to give the interface a slight touch of aesthetics or entertainment, computer work is fundamentally searching, reading and writing texts. And very often writing to a large and unknown audience - so you must be good at spelling and expressing yourself, if you deliver content to a website or participate in an online forum!

Now, we might argue that the most important element in online learning is the *dialogue*. But for the low educated the dialogue is abstract: it is performed in written language and it is very slow and formal compared to the live dialogue between people in “real life situations”.

The people behind the online dialogue are reduced to the messages, they post to the conference.

Again: this might be appropriate for a student studying roman history or math, but it is less appropriate for those “students”, who in a few month will be thrown into the jungle of the dark side of modern culture.

And even within a very successful online dialogue, you’re supposed to talk about the topics of the course – not about yourself. You are supposed to be more and more objective during the educational process.

So compared to the real life work of many of these “weak learners” computerbased learning has a rather sterile reputation: abstractness, formalism, textbased, informational, systematic, technical and so on.

Let me conclude here, that e-learning in fact should make things worse for these “weak” learners. It seems to be exactly the opposite of what they really need. Despite the big differences between the classroom and the virtual rooms, these nonlearners are facing exactly the same form of abstract discourse in the e-learning environments as they experienced in the classroom.

From weak learners to strong e-learners?

Why do we bother, then? Why not leave these unsuccessful learners to the shadows of the classroom and the pseudodrama of their personal tales. And to their passive media consumption – and let the higher educational student benefit from the online goldmines of e-knowledge?

There is three reasons for not doing so. A political, a social and an educational.

The political and social reasons are evident: a democratic society cannot accept to leave one third of the population to media illiteracy. Even the most cynical politician knows, that this would lead to economic and social disaster.

The interesting issue in this context, though, is the educational reasons for not giving up on these groups of nonabstract learners.

We just stated, that these people suffer from a lot of negative experience from the classroom and from the traditional educational system in general. So they have got nothing to loose with e-learning, one might argue.

The truth is, that there is a lot of *potential* in computerbased learning – and this is also true for the groups of nonabstract learners.

The problem is to understand what kind of qualities we are talking about in relation to these groups. And that brings us into the center of our topic: *how do we support these nonlearners in the e-learning environments?*

And furthermore the problem is to *reflect on our own mental models*, deeply rooted in the formal-abstract discourse, so that we can learn to design e-learning environments, that support the narrative, personal and practical oriented learning styles. And this is why I'm rather critical towards debates based on the experience of e-learning in higher education. *The experience of the nonabstract learning styles must be represented and acknowledged within the e-learning communities.*

Now, let us turn to some of the creative potential of the e-elearning environment.

Design elements for nonabstract e-learning environments

Let us establish some interesting relations between the learning needs of these groups and the potentials of e-learning.

First of all this group of learners need a mixed learning space. They need what we often call *blended learning*. They need to work with practical problems and they need a lot of face to face dialogue. So we must create models of blended learning, learning in diversity, alternating processes integrating on campus, on the job and online learning. We must learn to create models, that integrate the online environments in a fundamentally action based learning space.

We have discovered that many of these learners, after a certain hesitation and resistance, felt personally supported by the mentoring within the online dialogue. They did not like to expose themselves to large numbers of unknown online readers, but after some time they enjoyed the privacy and intimacy of the online dialogue with the mentor, teacher or a few members of the online group.

So the problems of written language was transformed into the possibilities of a private written dialogue, within which the learner felt safe and slowly began to engage in depth-reflections – not just in relation to the content of the course, but also in relation to the more personal attitudes towards learning.

So in this case the feelings of shyness and performance anxiety from the classroom was successfully exchanged with the experience of safety and privacy within the online dialogues.

These learners prefer storytelling to information and formal thinking. So we should learn to deconstruct our own academic models and try to design narrative based learning processes.

In fact one could say, that these learners prefer *art* to *science*. They tell stories about their life and they see a lot of movies, based on visual narrativity.

One of the great and very naive misunderstandings here would be to conclude, that these learners should look at pictures instead of reading texts. Just like small children. This won't do, because the text is the most important communicator of meaning in our culture. The problem lies elsewhere. The problem is the *nature* of the text, not the text in itself: does the text work in abstract formal language, or is the text organized as a story with a storyteller or a character to identify with? And furthermore: is the learner supposed to write abstract papers or can the learner write a story, mixing personal experiences and narrative organized experience?

There is knowledge in a novel, just as there is knowledge in a scientific magazine.

The knowledge in the novel is closely connected to personal emotions and experience, to life, and in fact therefore *closer* to life.

What kind of knowledge is needed to work with an alcoholic?

As Habermas put it some years ago: in formal abstract thinking the *Systemwelt* prevails over the *Lebenswelt* and forces its logics upon it. In the narrative language it is quite the opposite. So the differences between the abstract formal and the narrative learning style are enormous.

The personal approach is important in yet another way. The technology of ICT is often said to be too difficult or too unhuman. But giving room for the personal approaches in the learning processes, it often appears, that these nonabstract learners have some talent or gift, they have been hiding for some time. Very often it is possible to connect these talents to creative computerwork and very often this is the most successful way to develop the necessary personal ICT competencies. The personal interest and the personal need creates the will to learn. This kind of creative ICT training works much better than the traditional *abstract* ICT courses.

We should also encourage the learners to take part in the production of learning material, rather than letting them consume readymade and in a certain sense abstract products.

But, unfortunately, the e-learning environments are not developing in this direction. This is why it is so important to discuss, what *quality* really means for these populations groups.

Leaving the formalism and abstractness of the ICT training

These learning principles have major consequences for the design of the ICT training for these groups. Many of the weak learners have never used a computer, most of them are unexperienced learners and many of them believe that they will never learn to work with ICT. And they are trying to cover up their low self-confidence by announcing their total lack of interest in computer work. At this point we must hesitate. A lot of young dropouts are very skilled in computerwork – but they are indeed very poor learners. So the ability to use computers do not necessarily imply the ability to learn.

This is important, because the main purpose of the courses and activities in e-learning is about *learning competencies* – not ICT competencies.

Therefore I believe that we must focus on the learning competencies of these learners, not the computer competencies.

That is why I believe, that we should avoid the isolated ICT training and integrate the ICT training in the professional courses – and allow the learners to make a personal approach to the computer tools.

When the learners feel the desire to learn to master some digital tool, we must support them in learning to work with that specific tool. This means that we should design very flexible courses – but isn't that what it's all about: flexibility, personal approaches and differentiation?

There is, I believe, another misunderstanding here:

The defensive response to these learners' poor ICT skills has often been this: give them the most simple tools and give them some simplified LMS-platform with a lot of automatic facilities. Then they just have to learn a limited number of simple actions and procedures. *Perhaps we could even free them from the burden of learning...*

This will only confirm their feeling of being second class learners and citizens and this attitude will most certainly destroy the small amount of learning desire, still present in these classroom haunted people.

I think we should choose a much more offensive answer to the development of ICT competencies.

If we create a learning environment with a lot of flexibility and we allow the learners to find their own way around the computer tools, then we do not need to use the defensive strategies. Give them good and creative tools, and let them enjoy the growing self-esteem, that is a consequence of the new mastering skills. If they hate graphics and love to build databases, then let them do so and support them all the way. And offer them the best professional tool.

Now let us leave this very narrative discourse of mine and turn to a more systematic answer to the question: *what is quality in e-learning about for these learners and how should we support them?*

Quality principles for the design of e-learning environments for low educated or nonabstract learners

Let me try to be pragmatic and present a list of important issues about the meaning of *quality* in supporting the so-called weak learner. I will state these principles in such a straightforward way, that they can be used for further discussions:

- We support the wEak-LEARNER by establishing online environments, that allows the presence of the personal and emotial discourse; this is necessary if these learners should develop a fundamental will to and desire for learning
- We support the wEak-LEARNER by building online dialogues based on narrative and not on the formal informational discourse
- We support the wEak-LEARNER by developing privat and safe online rooms, in which these learners slowly can build up there self-confidens in close dialogue with a mentor, teacher or small online group
- We support the wEak-LEARNER by avoiding to put them in situations of exposure; this would keep the learners from experiencing that very satisfaction of successful self-expression, that is so important to their e-learning competencies
- We support the wEak-LEARNER by establishing online environments, that avoids the culture of the sterile, technical and alienating internetsystems; we should create human and realistic online scenes, in which the participants are allowed and invited to make mistakes
- We support the wEak-LEARNER by creating learning processes very close to their professional and personal life, instead of creating processes based on abstract and formal knowledge
- We support the wEak-LEARNER by integrating the ICT training in subjective meaningful learning processes, instead of isolating the ICT training into special and therefore abstract courses
- We support the wEak-LEARNER by integrating the development of personal information society competencies wherever it is possible: the competencies to include themselves is far more important than their being included by us
- We support the wEak-LEARNER by inviting and inspiring them to become active users of the different media, instead of passive consumers: we should not make the mistake of keeping them from *difficult tools and processes*; this will only confirm their lack of self-esteem; they

should be allowed the time and space to explore tools and processes, they become personally interested in; *technological fluency* is the overall goal

- We support the wEak-LEARNER by letting them take part in the production of educational material, websites and other online resources, instead of presenting them for ready-made objects
- We support the wEak-LEARNER by inviting them to work with design processes to develop their understanding and active use of the diversity of expression and media
- We support the wEak-LEARNER by integrating small and easy accessible online notebooks or logbooks and inspire them to write stories from their job, course activities or personal life; the most important mentor activity is to develop this ongoing commenting into reflections
- We support the wEak-LEARNER by avoiding traditional pedagogic approaches; in a way e-learning means the end of the traditional concept of pedagogy, that is strictly linked to classroom teaching; the online mentor should be co-operating with these e-learners instead of teaching them
- We support the wEak-LEARNER by establishing blended learning environments, because the personal and emotional approach is crucial to these groups of learners; thus we should allow time and money for a number of on-campus workshops during the courses
- Finally we support the wEak-LEARNER by working with the following threefold displacement, that should be built into the online courses for these target groups: from formal text to narrative text, from text to design
- and from computer work to real life actions.

The learning of learning...

The majority of e-learning environments are designed for average learners or further education learners.

The so-called wEak-LEARNERS, however, must *learn to learn and learn to e-learn at the same time*.

The e-learning environments designed for immigrants, young drop-outs, people with very little educational experience, just to mention some of the population groups with special learning needs, should be able to evoke the learning desire of these people. Make them wish to learn.

Mainstream e-learning environments will not be able to produce these specific motivational effects.

The design of e-learning for the wEak LEARNERS should take into account this complex challenge: the e-learning set-up cannot be *based on* presupposed learning competencies, but should, on the contrary, *produce* such competencies...

We believe that quality e-learning for low educated should be based on principles such as the ones listed above.

Author

Jan Gejel (E-learning consultant)
The Social and Health Care School Aarhus
Olof Palmes Alle 35 8200 Aarhus N DK
jan.gejel@skolekom.dk

GENDER ISSUES AND LEARNING ONLINE: FROM EXCLUSION TO EMPOWERMENT

Christine von Prümmer, FernUniversität in Hagen

Introduction

This paper addresses gender as an issue in Open, Online, and Distance Learning Environments, specifically the role of gender in learner support. It is based on my 25 years of experience with distance education (DE) at the German FernUniversität (FeU) and draws heavily on our own research and on comparative research, especially research with Gill Kirkup of the British Open University (OUUK). While our research topics and tools have changed over the years to keep pace with the increasing use of information and communication technologies (ICTs), our concern with gender equity has carried over into the “virtual” university. We are especially concerned with ways in which the internet could be used for the empowerment of women.

The concept of open and distance education has always been associated with the ideal of providing educational opportunities for minority groups and those who cannot access the educational system in the regular way. Although the social inequalities explicitly mentioned were mostly those of social class and ethnic backgrounds, other factors such as regional location, religion and gender were also part of the equation. For instance, the social movements of the 1960s and 70s in Germany, which gave rise to the creation of “reform” universities and culminated in the foundation of the FeU, had identified the “daughters of Roman Catholic working class parents in rural areas” as the single most disadvantaged social group when it came to higher education. My own research at the FeU has shown that distance education does serve as a second chance for women from a working class background to achieve an academic degree previously denied them (von Prümmer 1997, 2000). Nevertheless, issues of social inequality, including gender, do not play a significant role in our debates on the future of ODL/the “virtual” university and on student support services in online learning environments (OLE) (cf. Rekkedal et al. 2003).

Why is gender an issue in Open, Online, and Distance Learning Environments?

In my work as institutional researcher at a large Distance Teaching University (DTU) I have often come across the assumption that gender is either irrelevant or can be ignored as distance education systems are seen to be non-gendered or even to favor women.

Gender blindness vs. gender awareness

This view is mainly based on two reasons: Firstly, DE offers opportunities for studying without the constraints of time and place associated with traditional face-to-face education. This allows access for people who are prevented by work and family commitments or by other factors such as disabilities or lack of mobility to attend classes but who enjoy a degree of flexibility in their schedules. Women, especially the proverbial “housebound mothers of small children”, thus are seen as the primary beneficiaries of DE. Secondly, there is empirical evidence that large single-mode DTUs such as the British Open University (OUUK) and the Canadian Athabasca University (AU) attract a higher proportion of women than is customary at face-to-face universities in these countries. In fact, open and distance learning (ODL) “has provided for many women, perhaps their only chance to learn when other educational institutions were inaccessible to them.” (Kirkup 2003, p. 47).

Both reasons hinge on access, and the suggestion is that women and men have equal opportunities to participate in open and distance education (ODL) and that gender therefore plays no role in these learning environments. The example of the German FernUniversität (FeU), also a large single-mode DTU, proved this assumption wrong as less than a quarter of its student population in the early 1980s

were women, a severe underrepresentation compared to face-to-face universities as well as other DTUs. A large-scale comparative research project on the situation of women and men studying at the OUUK and the FeU uncovered a multitude of factors which impacted differently on men and women in both countries (Kirkup & von Prümmer 1990; von Prümmer 2000). Among these factors were the range of courses offered and chosen, course content and its presentation, types of student support services and forms of communication, learning styles and opportunities for interaction and cooperation, the structure and organisation of the degree programs, and – very importantly – students’ background and outside commitments and the resources at their command. Later, gender was seen to play a role in the increased use of information and communication technologies (ICTs).

Gender considerations in online education

As we move from traditional ODL toward increasingly “virtual” learning environments, there is no less need for concern regarding the effects of gender and the equitable participation of women in online education. In her book *The Third Shift. Women Learning Online*, Cheris Kramarae gives three reasons for attention to women’s perspectives: (1) Women are the primary users but not creators and educators; (2) mature women face significant barriers through multiple commitments and have serious financial burdens; (3) adult women are targeted as a primary constituency for online learning but little is known about their needs and interests (Kramarae 2001, p. 5).

On the face of it, women in countries like the United States may have equal access to the internet and the new technologies around which OLEs are built (Hentschel & Keeding 2001, p. 7). Some studies of online interaction show a blurring of gendered learning styles and even contend that “the virtual realm is a female domain” (Monteith 2002, p.64). Nevertheless, our research has shown prevailing gender patterns in the way in which ODL students can and do access, use and control these technologies (Kirkup & von Prümmer 1997; Kirkup 2001, 2003; von Prümmer 2001). Whether or not OLEs are inviting and friendly places for women depends to a large extent on the recognition of gender factors.

In short, gender is an issue in Open, Online, and Distance Learning Environments simply because – no matter how “virtual” they are – these environments are part of the “real” world and therefore gendered. Learner support, in particular, has to acknowledge gender as a category which shapes the provision of online education and which affects students and their ability to participate fully in open, online and distance learning.

What are the gender issues in online learning?

If we accept the premise that online learning is an extension of traditional open and distance education, we can draw on the findings from DE research in order to identify the gender issues in OLEs. Specific research will then show how these issues manifest themselves in the online learning context, and what other factors might impact differently on women and men studying online.

To begin with, it is important to note that gender operates both within and outside the distance teaching institution. The institutional goal of providing non-discriminatory learning environments may be compromised by adverse gender effects in either one of these spheres or through a combination of institutional and outside factors.

With regard to ODL providers we are dealing with institutions mainly interested in setting up and delivering distance and online courses to increasing numbers of students, and in creating the necessary platforms and technology driven learning environments. Often the composition of the teaching staff shows traditional gender patterns within the subject areas and staff hierarchies. Where development teams consist of men and women, the men tend to work on the technology, the women on the design and pedagogy of the OLE.

With regard to ODL students, evaluation studies show persistent gender differences in three areas: (1) access to, and control over, ICTs, available resources and the gendered division of labor; (2) knowhow and computer literacy, confidence, language and writing skills; and (3) learning styles, communication preferences, and usage of ICTs. The AU’s Master of Distance Education Module identifies the following

aspects: access and success; learning design an support system; technologies; content and curriculum; and practitioners' challenges as of particular relevance for women (Spronk & Roberts 1998, p.6).

Access and control

If we take the concept of "open" and distance learning seriously, we cannot afford to neglect issues of equity and overt or latent discrimination. It is true that many women have discovered the internet and its potentials. It is also true, as our research findings confirm, that gender differences still exist with respect to access to the technologies and control over resources.

A survey on computer access and use of ICTs for distance studies carried out in 1999 at the FeU (von Prümmer & Rossié 2000) showed that over 90% of the respondents could access a computer for study purposes, and that this proportion had increased quite drastically in the last few years. Significantly fewer students claimed to be experienced users (60% of the men and 40% of the women). Access to the internet, although higher among the distance students who participated in our survey than in German households in general, was less wide-spread: over half the respondents (55%) had access privately and just under half (49%) had access at work. The data presented in the following figures stems from a large-scale survey of FeU students done in 1999. While the percentages of women and men with access to computers and, more importantly, the internet, has increased since then, the tenor of the findings is still valid. Smaller surveys of students and staff carried out more recently have confirmed the gender differences as well as the patterns relating to subject areas.

Looked at more closely, though, the survey data did show the usual gender-differentiated patterns:

- Women mostly have access to only one computer, usually at home, while many men can access more than one computer and often have access to a suitable PC at their place of work.
- Women have less sophisticated equipment and software, especially as far as multimedia and ICT features are concerned.
- Women are more likely to leave the purchasing decision to their husband / partner and less likely to be the main user.
- Women face more restrictions in using the technology and have less control over the computer, which is likely to be used by other family members.
- Women have less internet access than men, especially at work, and must rely slightly more on the provision of the technology in study centres and other external sources.
- Women often have less experience, less interest, less confidence and less enjoyment in using the multimedia and ICT features of a computer.

There are still differences between the students in different subject areas as people studying mathematical and technical subjects – mostly men – are more likely to have a computer, people studying education, social sciences and the humanities – mostly women – are less well equipped. Still, the overall results showed hardly any gender differences in computer access, a result immediately taken up by the university as showing, firstly, that gender has become irrelevant with regard to the new technologies and, secondly, that mandatory computer and internet access would not be a problem for (prospective) students. At the very least the data analysis suggested that potential problems might be created for women distance students if they were required to own an advanced computer and high-speed internet access in order to study successfully.

Another survey, carried out in the summer of 2002 with FeU students, showed the main use of the internet for study purposes to be general information about DE (85.6%) and current information on important aspects such as updated examination times and places (76.3%) . With respect to internet use gender differences occurred in relation to coursework (? 50.6%; ? 62.1%) and information updates (? 72.3%; ? 80.5%). This may be due to men enrolling more often in technical subjects where more courses require online studying.

Based on research and experience we argue that the virtual university must not be left alone to develop "naturally", following technological advances and software revolutions without regard to their social effects. In order to ensure the full participation of women in the virtual university, factors which hinder this equal participation must be identified and measures taken to redress gender imbalances.

Characteristics of online learning environments

One essential difference between traditional face-to-face universities and DTUs in general as well as the virtual or electronic university lies in the fact that the learning environment becomes the private concern of the student. The learning environment is no longer provided on a campus and in university buildings. Factors outside the university determine the learning setup and environment to at least the same extent as do the university's study rules and regulations. The student rather than the university takes responsibility for the conditions in which studying takes place and therefore the student's personal life, resources and access to technologies become increasingly important for her/his study success.

The "privatised" learning environment has some advantages. Students no longer have to fit in with schedules and locations set by the university. Their learning activities are more compatible with their other commitments. Many students, especially women, have no other way of pursuing their education and studying at a university. Students can communicate with other students and with tutors/lecturers either live or through asynchronous channels, working in groups and cooperating without spending time and money on travelling.

The "privatised" learning environment also has some disadvantages, especially when seen from a perspective of social inequality and gender. Students are responsible for setting up their own learning environment and have to supply the necessary equipment. Electronic communication and online studying require costly hardware, software and online-access but not all (potential) students have the necessary resources and financial means. Women are more likely to be among those who find it hard to afford studying via the internet.

Communication and study success

The social division of labour in western societies leads to gender differences in the personal circumstances of women and men, including access to the internet and the electronic university and the communication channels associated with these. Research in the field of open and distance education has shown the importance of communication for the successful studying of women distance students: It helps them to assess their own situation through comparison with others in similar circumstances. It shows where difficulties and „failure“ might be due to structural factors rather than to individual inadequacies. It shows potential ways to improve their situation through learning about solutions used by other students. It is a means of breaking out of the isolation associated with distance and virtual learning.

Internet communication can help to reduce feelings of isolation which are more of a problem for women than men (Kirkup 2003, p.49). Women distance students often find it difficult to meet other students in person because there are few study centres and students have to travel great distances to reach them. Not only is travelling to study centres time consuming and expensive, women also find it difficult and expensive to organise childcare or the care of invalid dependants. Another problem might be the fact that there simply are too few women on a given course, e.g. in mathematical and technical subjects. For these women the internet can mean a real opportunity for communication and networking because the diverse forms of communication allow asynchronous as well as synchronous contacts and exchanges, and e-learning offers possibilities for cooperation and connectedness without forcing women to travel and be present at specified times in specified places.

But there is also the danger of increased isolation if communication happens exclusively through the internet. This is especially true for women who are not employed outside the home and are less likely to meet other students – or even other adults – in person. Women, much more often than men, have multiple commitments as mothers and homemakers, frequently in addition to full time or part time

paid work outside the home. Often considered to be able to make their own schedules and manage their time independently, working mothers actually have highly fragmented workdays, having to fit their studying and their internet use around the demands of family and employment.

How can the institution support women students?

ODL institutions can adopt two approaches to learner support for women which are not mutually exclusive.

Affirmative action and gender mainstreaming

Measures of “affirmative action” or “targetting” in OLEs ensure that individual women or groups of women students are not disadvantaged. They include women-only study groups/courses/seminars, computer literacy classes; women tutors/counsellors; feminist/women’s topics and concerns; provision for communication and interaction and networking. A successful example of this was a specific use of email in an online seminar of the VINGS project, with the expressed goal of creating community and motivating students to participate in discussions, submit assignments and complete the course. A report including the email experiment will be available in 2004. (For information on the project see <http://www.vings.de> “overview”.)

“Gender mainstreaming” ensures the integration of gender perspectives in all aspects of online teaching by reflecting on potentially differential effects of content, presentation, organisation and structure, etc. (Jelitto 2003, p.1). The consistent use of gender-inclusive language and non-stereotyping images is an example. By now, gender mainstreaming has become a catch phrase in politics and a mandatory requirement for government funded projects in the European Union. Universities include gender mainstreaming and equal opportunities in their mission statements. But in order to be effective, all levels of teaching staff and administration have to be aware of the implications this goal has for their practice.

This means that gender as a category must be present in planning and implementing the new online learning environments. In order to support women students, OLEs must be designed as women-friendly, non-discriminatory places, and students' personal environments and life situations must be taken into account. As these circumstances have profound effects on the way in which women and men are able to organise their lives around their studies and to pursue their academic interests successfully.

Examples of good practice

One area of support and services for (potential) women students are measures promoting the necessary computer-literacy and user confidence as well as supplying easy-to-use software with instructions which can be followed by people who are not familiar with computer jargon and don't aspire to become computer experts.

Another area is the field of content, presentation and curriculum. Women's studies and gender studies have been shown to be effective in redressing some of the existing imbalances of an androcentric educational system by focussing on previously neglected issues and by looking at these from a different standpoint. The success of these programmes suggests that one of the ways to promote women's participation in the virtual campus is the inclusion of women's/gender studies in the curriculum, dealing specifically with gender-related issues and developing women-friendly ways of using the new technologies for teaching and learning processes. Prominent examples of this are courses offered by DTUs, namely the AU Master of Distance Education (MDE) degree which includes a course on "Special Topics: Gender Issues in Distance Education"; and the OUUK Masters Programme in Cultural and Media Studies which includes a module on "Gender, Technology and Representation: Women, Machines and Cyborgs".

An example of a different approach is the VINGS-project developing an interdisciplinary and inter-university degree programme of "Virtual International Gender Studies". The project is a pilot not only

for its feminist content and curriculum and its use of ICTs, but also for the co-operation of the four participating universities, including the FeU, in course production and design, student support and crediting systems. Considering the limited resources and the high costs of developing high quality teaching materials and maintaining effective and conducive structures for interaction, it is very important that women from different universities, and from different countries, are given the opportunity to set up networks for co-operating and for sharing not only course materials but also their teaching and learning experiences and the results from their evaluation research. In this way duplication can be avoided, both of materials and of mistakes, and a larger store of courses by and from women can be built up.

Conclusion

There is a tendency to assume that more and better equipment, more sophisticated computer programmes, more powerful data transmission, and increased communication technologies equate higher quality education. But is this true? We contend that "better servers" in the university do not automatically mean "better service" for the students, especially with regard to gender-specific patterns in access and study conditions. DTUs must no longer ignore the social and political implications of ODL provision as this adversely affects the chances of women. For instance, the proponents of virtual universities tend to focus on the technologies at the expense of the human element – we all know of cases where seemingly endless amounts of money are being spent on buying the hardware, and little or no money is spent on hiring and training the staff who will have to work with this technology, or on making sure all students and staff are computer-literate.

There is also a tendency of funding bodies and decision-makers to focus on subject areas which have an obvious affinity to technology such as the male-dominated fields of Computer Science and Electrical Engineering, and to be less open to developments in "unlikely" subject areas such as philosophy and literature which are more popular with women students. In fact, in the last few years some very interesting multimedia courses on the internet or on CD-ROMs have been developed in subject areas such as law, psychology, literature, and even philosophy.

To the extent that ICTs replace the traditional media and access to advanced technologies becomes an essential prerequisite for studying in the virtual university, there is an increasing danger that women will be disproportionately disbarred from entering and enjoying the virtual learning environment – unless gender issues are taken into account and the definition and construction of the virtual university is no longer left to the existing male-dominated, androcentric academic and political decision-making processes or to "market forces". It is up to the institutions of open, online and distance learning to provide unhindered access and to encourage women as well as men to use the full range of possibilities offered by the new educational environments. It is up to the women to make use of these for achieving their own goals of study success and personal empowerment.

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Author

Dr. Christine von Prümmer
FernUniversität in Hagen, ZFE (Centre for the Development of Distance Education)
Postfach, 58084 Hagen, Germany
christine.vonpruemmer@fernuni-hagen.de

ETHICS IN DISTANCE EDUCATION

Philip C. Tesch, Concordia University Saint Paul

Ethics for Learners

The conduct of individuals involved in the formal learning process has been modeled and learned in the western tradition over five hundred years. Growing up in and being a part of a classroom culture is deeply ingrained. Students have a rather clear expectation of how they are to behave based upon the traditions of classroom learning. Compulsory education has ensured that a very high percentage of the population knows what to expect and what is acceptable or not acceptable within the walls of the brick-and-mortar school.

The phenomenon of distance education is still in its comparative infancy, made possible and practical by the omnipresent internet, affordable hardware, and the connection provided by eager internet service providers. While high-speed connections up the ante somewhat, the hardware demands are modest and within the reach of millions of learners. Public access points and assistance programs make it possible for many learners living in poverty to avail themselves of on-line learning opportunities.

There is significant disagreement about what is ethical or unethical and how ethical consensus is reached. John Fletcher Moulton asserts that there is a “large and important domain in which there rules neither positive law nor absolute freedom... It is the domain of obedience to the unenforceable. That obedience is the obedience of a man to that which he cannot be forced to obey. He is the enforcer of the law upon himself.”[1]. When a society or government observes that people are not conducting themselves the way they ought to – that they cannot be trusted to do the right or good thing – then laws, rules, or regulations are developed, moving things from unenforceable to enforceable.

The source of Ethics

Ethicists and philosophers spend a good deal of energy attempting to discover the sources for the values held by people. Sources most commonly recognized include parents, family, sacred writings, clergy, teachers, and leaders in government, commerce, sports, and the arts. Many of these relationships have involved thousands of observations and transactions which have been interwoven into a moral fabric that, while having many common features with others, is unique and helpful to an individual. As large as our law library and volumes of statutes and ordinances are, they do not come close to containing all the guidance and parameters for making decisions on a daily basis which impact the lives of others.

How does an on-line learner come to know the rules? The teacher (or other institutional authority) can define the rules, which most often identify conducts which will be sanctioned. These rules may be in the form of a contract or a user agreement which must be signed before the learner/user gains access to the learning resources. When carefully drafted, these agreements protect the educator, the hosting institution, and even other learners. One might expect, however, that the more the contract or agreement contains, the less likely it is to be read, understood, or complied with. Learners vary greatly in their reading and comprehension skills, in their level of sophistication, and even in their willingness to violate agreements if they find it expedient to do so. Integrity and faithfulness are increasingly rare virtues at the beginning of the 21st century.

Much more powerful than one-sided agreements in defining moral or ethical conduct are the dominant trends so evident in the non-educational world. The on-line native-speakers (a term used by Marc Prensky to describe individuals who have grown up using computers) look out upon the expanding wealth of digitized words, graphics, and sound as being *theirs*. They argue: “It comes up on my

screen. I've done nothing illegal to access it." This is not far-fetched. They argue that those who want to protect their property keep it secure and out of sight. Someone who doesn't care about maintaining exclusive rights to something puts it in plain view of others who have a swift and easy way of capturing and storing the digitized property.

Education in ethics

Educational theory holds that what is learned early in life and reinforced throughout life has the best chance of being internalized and retained. It would be ideal if students in first grade were taught that the work of others must be respected and acknowledged before it can be copied or integrated into an assignment. Students are learning at a tender age how to cut and paste intellectual property into a new source without any concern for the author, composer, or owner. Just as having an attractive car is in not an open invitation to steal it, so making digitized data available is not an invitation to violate the rights of its owner.

In long-established cultures, it is the elders who pass on values and mores to the young. By virtue of their experience and accumulated wisdom, they transmit both the barriers and the reasons for the barriers to the young. This is not the case with the digital natives. The realm is expanding so quickly that there is no well-settled body of right and wrong digital conduct to be transmitted from one generation to another. One computer user follows the lead of other computer users. If millions are sharing music files, a norm is established. Justifications for the behavior are familiar: we're "aiding" in the distribution; we're providing new readership; we're doing what we are told; everybody's doing it. The teachers of the new ethical standard are peers, not necessarily older or wiser. The consequences of the various conducts are not yet known or understood. Many want to look for laws or court cases as a curb, restraining illegal conduct, but that does not settle the ethical or moral issues. Even if it is legal, it may not be ethical.

It can be argued that the law of intellectual property did not anticipate the internet or the ease with which entire shelves of books contained on a single CD can be copied. We are immersed in goods and services which were not envisioned when our property laws were passed, and we have interpreted the laws (or re-written them) to fit what is new.

The ethical starting point

The key to ethical conduct in the use of digitized data is to seek or give credit to the owner or originator. It is the essence of scholarship not to devise something new, but to know what others have taken the time to write about and to acknowledge their effort. This fundamental virtue is quite un-American – to say that this idea, or these words, or this musical phrase or work -- is not mine, but must be credited to another. It is the honest act of a person with integrity. It takes practice and effort, and it is the right thing to do. Since it takes practice, it must be taught early and reinforced often.

While graduate-level research methodology students are taught how to format references and citations for theses, that is too little too late. What was once available only to university students in world-class research libraries is now available to anyone with a telephone line and a \$300 computer. Age-appropriate training on giving credit or acknowledging ownership should become a component of curricula at every level. Students must be led to understand that there is a fundamental difference between writing words or music and making copies of the work of others. When a student originates a sentence or a song, there is no need to attribute it to another. When a student incorporates a thought, a phrase, a sentence, a paragraph, a page, or an entire novel done authored by another person, the originator must be credited. Even if the source is not copyright protected, it remains the right thing to do.

When one submits work as one's own when it is not, there are usually no laws broken. What has transpired is misrepresentation, fraud, deceit, or lying. While there are many motivations for violating

principles of academic integrity, there is ample evidence that it takes place frequently in North America [2].¹

Ethical common denominators

In one sense, there are not different ethical standards for distance education students when compared to classroom students. All have the obligation to demonstrate virtues such as honesty, integrity, respectfulness, accountability, etc. In both classroom and distance environments, teachers have found it useful to communicate clearly how these features are understood within the context of a particular course or program. For example, an instructor may want to communicate clearly that only papers written specifically by the student for this particular class are acceptable. In doing so, there is reinforcement for the message that only the student's original work is to be submitted.

It is also critical that the teacher model the ethical principles by which he or she expects students to live. A teacher who violates copyright provisions or incorporates the work of others beyond fair use provisions both confuses students and misses out on opportunities to model the desired behavior and development sought in the students.

A foundational ethical principle that reaches far beyond the realm of education is "do no harm." On one level, this forbids striking the teacher or a classmate. It means that students in a laboratory must follow safety procedures. Those engaged in distance education have different variations on the same theme. Both teachers and learners have a moral obligation to take reasonable, age-appropriate steps to prevent the distribution of computer viruses. Teachers and learners must respect each others' privacy and refrain from sharing personal information about the participants outside the learning enterprise. This becomes increasingly important in cohort-based programs in which the learners come to know a great deal about each other over an extended period of time.

Many academic disciplines have developed codes or credos for instructors and students to guide inform the conduct of those engaged in study. The National Communication Association, for example, "advocates truthfulness, accuracy, honesty, and reason as essential to the integrity of communication... We condemn communication that degrades individuals and humanity through distortion, intimidation, coercion, and violence and the expression of intolerance and hatred." [3]

Participant integrity

One of the most frequently-asked questions asked of distance educators is: How does the instructor know for certain that it is the registered student who submits the work or posts to the bulletin board or contributes to the chat? Some teachers ask students to use a variation of the honor code statement "I have neither given nor received unauthorized assistance, nor do I know of others who have" whenever work is submitted. Many distance educators would have to admit that some work has undoubtedly been submitted fraudulently, but the same thing could be said of face-to-face classes as well. Distance educators need to be aware of tools which assist in identifying plagiarized text. Many traditional schools now forbid electronic devices of any kind in the classroom, because picture phones can transmit test or textbook images and MP3 files can be heard from a player the size of a student's thumb.

While a few distance educators work in isolation without the assistance of IT/IS support, most distance education takes place within an enterprise system requiring establishing an account and using a password. If maintaining system security is not covered by an agreement or code of conduct, users must come to know that it is wrong and unacceptable to share access information which enables access to systems for which the user is not authorized. Users who repeatedly use academic system bandwidth for non-academic purposes are using system resources in a way which causes harm to other users.

¹ Fifty percent of Americans of college age (18-25) admit to telling serious lies that either hurt people, violate a trust, have legal consequences, or are totally self-serving. While the research did not focus on academic behavior, it is reasonable to conclude that academic behavior is included in the aforementioned categories.

Respecting the learning participants

The internet has come to be known as the great leveler of the playing field (every user “looks” alike; what is published on the web is not as dependent on power and prestige when compared to previous publishing patterns). Consumerism in higher education has resulted in lowered respect for professors. Much of distance education is still dependent on text, a two-dimensional aspect that reveals only a thin slice of a teacher’s skills. Showing respect and maintaining civility is an ethical consideration that should be a part of the distance education “wallpaper” – the backdrop -- in front of which the learning and changing take place.

Doug Johnson also emphasizes the importance of articulating values. He urges that teachers “clearly display lists and create handouts of conduct codes. Reinforce ethical behaviors and react to non-ethical behaviors. Stress the consideration of principles rather than relying on a detailed set of rules. By applying guidelines rather than following rules, students engage in higher level thinking processes and learn behaviors that will continue into their next classroom, their homes, and their adult lives.[4]

Ethics is always controversial because those who discuss ethical issues hold different values and prefer different systems for analysis. Issues arise so rapidly in fields linked to technology that we can only speculate where the new ethical dilemmas will lie.

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Author:

Philip C. Tesch
Concordia University, College of Graduate and Continuing Studies
275 Syndicate Street North
Saint Paul, MN 55105
tesch@csp.edu

LOW COST/HIGH OUTCOMES APPROACHES IN OPEN, DISTANCE AND E-LEARNING

Ulrich Bernath & Thomas Hülsmann, Carl von Ossietzky University of Oldenburg

Introduction

The title suggests an attempt in the tradition of comparing the cost-effectiveness of different systems in distance education. Historically, such comparisons have contributed highly in consolidating distance education as a legitimate option for educational provision (Wagner, 1972, 1977; Laidlaw & Layard, 1974; Eicher & Orivel, 1980; Orivel, 1987; Harry & Rumble; (Ed.), 1982). These studies have established a methodology of cost comparison and a base of evidence showing that distance education has the potential to be cost-effective or, putting it in the words of the title, may lead to *low costs and/or high outcomes*.

Over time the landscape of distance education has grown more varied both in terms of technology and in terms of organisation. Information and communication technologies allow more sophisticated use of media both for course development and for learner support with a tendency to drive overall costs up. To already established hybrid organisational models of distance education (dual mode, mixed mode, consortia) technological developments have added virtual and blended models of provision and co-operation, adding to the complexity of today's picture. The question arises to which extent organisational arrangements may counteract the upwards drift of costs triggered by the new technological options. The argument here is the following: (i) distance education is a system which includes a variety of sub-components, e.g. the development of materials and provision of learner support; (ii) technology convergence allows seamless integration of sophisticated resource media (including video clips and simulations) as well as tools for responsive communication between teacher and learner which tends to drive costs in both major subsystems; (iii) the ease by which collaboration between institutions is technically possible, means that it is increasingly unnecessary that all system components of a distance education system be hosted with a single provider; (iv) this means that lost efficiencies in distance education due to the increased cost of these enhancing capabilities could at least partially be recovered by intelligent networking.

"Technology and e-business approaches make it possible for integrated processes of open and distance education to be disintegrated into their constituent parts: curriculum development; content development; learner acquisition and support; learning delivery; assessment and advising; articulation; and credentialing. These processes can then be managed by different organisations." (Rumble & Latchem, 2003, p.134)

The most comprehensive list of reasons for co-operation has been provided by Rumble & Latchem (2003, p. 128). This list is used slightly modified in Table 1 as an advance organiser for the rest of the paper and illustrates how the Centre for Distance Education (ZEF) at Carl von Ossietzky University of Oldenburg has engaged in various forms of co-operation and achieved noticeable synergies. Five such models of co-operation are described:

1. *The Branch Model (BM)*: ZEF co-operates with the FernUniversität Hagen (the main distance teaching university in Germany) to provide educational counselling and tutorial services to their students in the North Western regions of Germany. For the state of Lower Saxony this is a low cost option since local students are qualified at marginal costs. At the same time this arrangement contributes to the efficiency of the FernUniversität Hagen.
2. *The Shared Leadership Model (SLM)*: As a member of the European Study Centre Network North West Germany (ESCN) ZEF co-operates with the distance study centres at the universities of Bremen and Hamburg, Hildesheim, and Lüneburg. The aim includes facilitating European-wide collaborations in distance education.

3. *The Subcontractor Model (SM)*: ZEF co-operates with the University of Maryland University College (UMUC) to develop and teach online courses within the Master of Distance Education (MDE) jointly offered by UMUC and Oldenburg University.
4. *The Shared Ownership Model (SOM)*: ZEF co-operates with three centres for distance education at other universities in Lower Saxony to operate a technical infrastructure for online distance education (Via Online). This again is an efficient way of capacity building, which allows the participating centres to offer services to their own universities as well as selling services to outside clients.
5. *The Franchise Model (FM)*: ZEF has developed course material for professional development in nursing which has been franchised to other universities. In this case ZEF operates as a curriculum developer and content provider. The cost-efficiency depends on scale economies which can only be achieved in such broad alliances.

Table 1: Reasons for co-operation (based on Rumble & Latchem, 2004, p.128)

	1. BM	2. SLM	3. SM	4. SOM	5. FM
share costs/spread them over a larger number of students	v	v	v	v	v
share resources, academic or commercial expertise	v	v	v	v	v
share risk	v	v	v	v	v
form alliances with potential competitors and interlopers	v	v	v	v	v
attract funding opportunities		v	v	v	v
form public-private partnerships to provide online courses		v	v	v	v
achieve a competitive edge and greater market share		v	v	v	v
be fast to market or cope with major market demand through joint course development		v	v	v	v
promote and operate credit transfer	v	v	v		v
jointly market programs		v	v	v	
capitalise on partners' knowledge of, and reputations in local markets	v	v	v	v	v
accommodate other countries' governmental requirements	v	v	v		v
ensure adequate provision of local services (e.g. marketing, counselling, admissions, registration, examination...)	v	v	v	v	v
de-bundle learning materials, tutorial support and course assessment	v	v	v	v	v
achieve a franchise arrangement		v		v	v

In order to understand the different models of co-operation it is necessary to understand the institution which engages in these alliances, the Centre for Distance Education (ZEF) at the Carl von Ossietzky University of Oldenburg in Germany.

The Centre for Distance Education (ZEF)

Germany is a Federal Republic and education is a state, rather than a federal responsibility. For a distance teaching university to operate across state jurisdictions it was necessary to seek partners within the different states. The FernUniversität in Hagen in the State of North-Rhine Westfalia, the main German distance teaching university, did this when it extended its reach to Lower Saxony. The State of Lower Saxony itself had a genuine interest in providing its citizens with a distance learning option and supported the creation of three distance study centres in 1978 at the universities in Hildesheim, Lüneburg and Oldenburg. In this 'Lower Saxony Model' the central university units are charged with two main responsibilities: (i) to provide effective support for Lower Saxony citizens who attend courses offered by the FernUniversität, and (ii) to contribute to the development of distance learning at their own universities (cf. Bernath 1994a)

To meet this double responsibility the state of Lower Saxony provided ZEF with ample funding until 1989. While the early focus was on supporting students of the FernUniversität, ZEF began as early as 1983 to launch additional initiatives, mainly by attracting outside funding. Since 1990 all further expansion of activities had been exclusively funded by (i) increasing internal efficiency (e.g. the use of ICT for administration and more flexible student support); (ii) engaging in local, regional, national,

and international alliances and networks; (iii) attracting third-party funding; and (iv) generating revenue through tuition and fees.

To get an idea of the order of magnitude of the funding: In 2002 the state allocated ZEF with €430 000 for personnel and materials. This corresponds with 0.6% of the overall funds allocated to the University of Oldenburg. €263 380 of these €430 000 were used for permanent staff leaving only €166 620 for ZEF to manage at its discretion. Of this €125 000 are recurrent costs for additional personnel and merely €41 000 were freely available for running the centre.

This shows the need for ZEF to supplement its budget by generating revenue from other activities if it wanted to further expand. And indeed, ZEF succeeded in generating additional flows of revenue, which varied between €200 000 and €400 000 in the fiscal years 2000 to 2003. The self-financed share of the total personnel and material costs swayed between thirty and fifty percent. Depending on the field of activity the self-financing quotas range from zero to about eighty percent (Bernath, 2003).

The Branch Model

As mentioned above, ZEF was established in 1978 by the state of Lower Saxony in recognition of the services that a distance teaching university like the FernUniversität in Hagen could offer to many still excluded from higher education. ZEF was to support Lower Saxony residents in making effective use of this new option by providing support services similar to those the FernUniversität provides to its own students in North-Rhine Westfalia. In the winter semester of 2002/3, 609 students from the FernUniversität registered with the ZEF at the University of Oldenburg. 78 students studied full time and 428 were part time students; the remainder registered for only a single course.

In addition to advising and counselling of interested and/or already active students at the FernUniversität ZEF offers 3 000 hours of tutorial support annually. This support is provided by mentors in face-to-face meetings in the evenings, Saturdays, during residential weekends and summer schools or as online tutorial support.

In the following outcome measures in terms of degree equivalents will be used. Degree equivalents are accumulated credits earned by all students divided by the number of credits required for a full degree. In the context of distance teaching universities this measure of success is more appropriate than only counting degrees and is applied by the FernUniversität itself (cf. Bartz, 1996). Systematic enquiries of students supported by ZEF suggest that they successfully participated in ca. 600 exams in 2002/3. For a full degree 16 such exams are required, thus the outcome measure for 2002/3 is 37 full degree equivalents.

This allows us to determine the cost per full degree equivalent incurred by the State of Lower Saxony. Within the ZEF budget about €300 000 annually are set aside for supporting the FernUniversität's students registered with ZEF. One could therefore conclude that the state of Lower Saxony pays €500 per student and about €8 100 per degree equivalent. If we add overheads based on shadow prices for rent and apportioned management costs according to the controller of the University of Oldenburg, costs would rise from €300 000 to €400 000, leading to a per student cost of €670 and €10 000 per degree equivalent. While there are no benchmark figures which would allow comparing costs per graduates (or degree equivalents) it is possible to compare costs per student. According to the Federal Statistical Office, the State of Lower Saxony annually spends €8 000 for every Lower Saxony university student. Hence, compared with this amount €670 spent by ZEF is by far the more cost-efficient option. It suggests that the investment into the Lower Saxony study centre model may qualify as a low cost/high outcome choice.

The FernUniversität's reasons to co-operate are obvious (cf. Table 1). Oldenburg University's main reason to participate is to enable Lower Saxony citizens' access to effective participation in the FernUniversität's courses. This is in the interest of the State of Lower Saxony, the university's main funding body. It also coincides with the remit of a public university to serve the local community, in this case the citizens of Lower Saxony.

The high quality of outcomes is further confirmed by SERVQUAL survey results from the years 1998 and 2002 which attest Oldenburg ZEF a high quality of service (Hohlfeld, 2003).

The Shared Leadership Model

In 1992 the European Study Centre Network North West Germany (ESCN) was established by the three Lower Saxony distance study centres and the distance study institutions at the universities of Bremen and Hamburg. The objectives of the network are related to the Maastricht Treaty, which envisions a central role for distance education in facilitating cross border collaborations in education (Bernath, 1994b). Within this model of co-operation partners take turns in co-ordinating ESCN activities for one year. However, temporary or more specific tasks are handled by colleagues from the participating centres.

The average annual costs incurred by ZEF for to this co-operation amounted to €10 000 over the past three years. In spite of this small financial outlay the ESCN membership spins off considerable benefits, e.g.(i) being a member of the Euro*MBA consortium; (ii) co-operating on a contractual base with the British Open University (OUUK); (iii) realising third-party funded project like the integration of foreign-language distance studies in traditional university study (Bernath, 1994c); and (iv) running various other projects supported and promoted by the European Commission.

The main benefit of the co-operation is to have built a vantage point that allows to scan options of co-operation for which European funding would be available (cf. Table 1).

The Subcontractor Model

In the years 1996 to 1998 ZEF, in conjunction with the University of Maryland Institute for Distance Education and the University of Maryland University College (UMUC) successfully developed and implemented a world wide accessible 'virtual seminar for professional development' for distance learning experts (Bernath & Rubin, 1999). These experiences inspired UMUC to plan a Master of Distance Education (MDE) delivered completely online. These plans were realised in co-operation with ZEF, which in turn sought the co-operation of the School of Education at Oldenburg University. Teaching started in the spring term 2000. Neither university would have been able to develop and offer such a program on its own (cf. Bernath & Rubin, 2003).

From January 2000 to the Summer term 2003 a total of 949 students successfully completed 42 courses provided by the University of Oldenburg. Since each course is rated with three credit points and the degree requires 36 credits these figures allow us to calculate the number of degree equivalents: Oldenburg students earned 2 847 credits or 79 (i.e. $2\,847/36$) full degree equivalents.

During the time between January 2000 and August 2002 the University of Oldenburg earned €530 000 in tuition fees, while the total costs to ZEF during this time amounted to €660 000. Thus, approximately 80% of the activities were financed through revenues. The spectrum of activities included the development and implementation of Oldenburg's courses, the formation of an independent research focus point through the *Arbeitsstelle Fernstudienforschung* (ASF) - a joint unit of the Schools of Education and ZEF to promote research and development in distance education -, and participation in the joint planning of the overall program. Other elements such as student administration, and the provision and operation of the technical platform are contributed by UMUC.

Hülsmann (2003) provides a detailed cost analysis for both the development and the implementation process of Oldenburg's MDE courses. The determined costs of course development are between €6 000 and €23 500. The costs for presentation (i.e. the actual teaching) of a course sway between €5 000 and €6 500 per course.

Given a total cost of €660 000 Euro and 79 degree equivalents the cost per degree equivalent amounts to approximately €8 350 Euro; and for 949 course enrolments the costs per course amount to approximately €700. Thus, the University of Oldenburg contributes the amount of €1 670 to each degree and €140 to each course participant from its own funds. This includes non-recurring and short-

term funds provided from the university's structural fund. At the end of 2004 when the University of Oldenburg's internal funding ceases the financial contribution will drop to approximately €900 per degree and approximately €80 per course enrolment. Given the high rate of cost recovery through tuition the university's investment in the project is quite low.

The quality of the outcomes has been acclaimed. The MDE received the "2003 Program of Excellence Award" from the Distance Learning Community of Practice of the University Continuing Education Association (UCEA) (www.ucea.edu/2003copawards.htm) and received the Sloan Consortium's 2003 "Most Outstanding Online Teaching & Learning Program" Award (www.sloan-c.org/aboutus/awards.asp/). Against the benchmark of UMUC's standardised course evaluations the instructional activities in the University of Oldenburg courses are well above average and contribute to this success.

There have been a number of spin-offs from the MDE co-operation. They include:

- The ASF book series on distance education (www.uni-oldenburg.de/zef/mde/series/);
- The partnership with the World Bank's Global Development Learning Network, which led to the Task Force Distance Education for Sustainable Development (www.uni-oldenburg.de/zef/desde/) including the joint development of the certificate program "Distance Education for Development" with the University of British Columbia (www.uni-oldenburg.de/zef/desde/ded2.htm);
- The successful bid for hosting the 3rd EDEN Research Workshop in Oldenburg; etc.

However, given that the outcomes of the co-operation neither serve students of the University of Oldenburg nor are economically profitable, it may be asked why Oldenburg University supports the program? This may be seen on three levels: First, taking part in such an internationally acclaimed online program enhances the profile and international visibility of the institution and within the professional world of distance education. Second, participating in such pioneering programs can also be seen as a measure of internal capacity building. The co-operation enables gaining rich experiences in (i) how to reach international audiences including the teaching of courses in a language other than German; (ii) how to conduct effective online courses; (iii) how to generate additional revenue flows by offering further education and professional training programs. Third, these operations provide employment opportunities, which allow the university to sustain a knowledge base in an operational area which is likely to expand (cf. Table 1).

The Shared Ownership Model

The Centre for Distance Education has used electronic media in distance studies since the mid 1990's. Successful grant applications from various third party funds propelled the development of online teaching (e.g. 'virtual seminars') and continuing education (Bernath et al., 2003). These funds allowed the collaboration with the distance learning and computing centres at the universities in Lüneburg and Hildesheim in order to set up an efficient Learning Management and Content Management System (LMS, CMS) based on Lotus Notes and Lotus LearningSpace. This led to a sustainable shared infrastructure called "VIA Online" with the purpose of guaranteeing a robust e-learning and online distance learning infrastructure, and to advise, train and support instructors and students from within the university as well as outside clients.

The co-operation model equally splits the costs of operation of the infrastructure between the distance study centres of the Universities of Hildesheim, Lüneburg and Oldenburg. Oldenburg carries an annual share of €50 000 which is spread over a multitude of project and students. Experience suggests that the average cost per project (including course shell creation and user administration) varies between €1 500 and €3 000, and that the per student cost for software and user license amounts to about €20. Given that more than 1 000 users currently participate in the system the annual cost per user is already down to about €50.

None of the centres on their own would have been able to initiate and operate a technical infrastructure of comparable capacity. The model of co-operation made the Oldenburg University a main stakeholder in a technical infrastructure which allows for a global outreach. Operations extend over state, national and, indeed, European borders and capabilities have been developed to serve different language

communities including English and Russian. To which extent the university will be able to turn these achievements into a competitive edge depends on its policies.

The Franchise Model

Between 1985 and 2002 ZEF, in conjunction with the Psychology Department of the University of Oldenburg, developed a certificate program for professional development in "Psycho-Social Aspects of Nursing". Since the beginning of the program in 1992, which included weekend seminars for nurses over 2 500 interested learners from one Swiss and ten German universities have participated. The co-operation developed into a network capable of delivering an effective, mostly self-financing continuing education program for public health care specialists (cf. Bernath & Fichten, 1999).

The project costs for the years 1992 to 1997 are described in Hülsmann (2000). Course development costs amounted to about €50 000. Spread over 1 260 students this amounts to only €40 per student. Participants were charged € 50 per student for the course materials and allowed for continuous re-development and updating of the material. These fees were collected by the partnering universities which distributed the materials. Had this project remained restricted to the University of Oldenburg the development costs for the study texts would have amounted to 250 Euro per student!

This professional development measure was subject to a permanent quality control to which all network participants had agreed. In 2001 an extensive survey examined the effectiveness and sustainability of this program and was conducted with all "Psycho-Social Aspects of Nursing" program participants (Fichten, 2004).

Conclusions

The message this paper implies is that one needs to observe and take the current (and changing) educational landscape into account. The various approaches illustrate that ZEF used different means for different undertakings. We do not propagate subcontractor or franchise models as the best option. Our aim is to encourage the exploration of possible synergies and construct mutually beneficial alliances. By doing so there is some evidence that high outcomes at low costs can be achieved.

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Authors:

Dr. Ulrich Bernath, Adjunct Professor (UMUC)
Carl von Ossietzky University of Oldenburg
Center for Distance Education
26111 Oldenburg/Germany
ulrich.bernath@uni-oldenburg.de

Thomas Hülsmann, MDE Faculty
Carl von Ossietzky University of Oldenburg
Center for Distance Education
26111 Oldenburg/Germany
thomas.huelsmann@uni-oldenburg.de

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DISTANCE EDUCATION TEACHERS IN THE DIGITAL AGE: NEW ROLES AND CONTRADICTIONARY DEMANDS

Sarah Guri-Rosenblit, The Open University of Israel

Introduction

Many of the distance teaching universities that have been established since the early 1970s were forerunners in redefining and reshaping the roles of their academic staff to match their unique learning/teaching environments. Distance teaching requires academics to devote far more time to the preparation of study materials than they would for a face-to-face classroom preparation. In many distance teaching universities the academic staff work in the framework of teams in the process of developing the self-study courses, which restricts in several aspects their academic freedom (Perry, 1977; Daniel, 1996). An additional important pattern of many distance education institutions has been the breaking up of the teaching responsibility between many actors. The question of: "Who is the teacher in a distance teaching university?" generates quite often contradictory answers, and is perceived differently by the heads of distance education institutions, the senior academic faculty, course coordinators, counselors, tutors and students.

The new information and communication technologies (ICT) challenge profoundly the organization of academic life both within classical and distance teaching universities. The ICT are irreversibly transforming the ways we learn, teach, generate knowledge and conduct research, and academics are expected to adjust to the future changes of their traditional roles (AFT, 2001; Bates, 2001; Evans & Nation, 2000; Guri-Rosenblit, 2001, 2003; Van der Molen, 2001). The new teaching and learning environments require the academic staff in both conventional and distance teaching universities to assume new responsibilities and to develop a range of new skills and talents. The ICT pose some critical dilemmas for policy makers in distance teaching universities and challenge some of the underlying premises of the industrial model upon which the large scale distance teaching universities have been operating in the last three decades. The induction of the distance education teachers into the new forms of delivery necessitates the establishment of new professional support services, and a total overhaul of the whole course development procedures and the teaching and counseling apparatus of the distance teaching universities.

This paper contrasts the roles of distance education teachers within the framework of the industrial model as compared to the premises of the digital age, and analyzes the contradictory demands and new roles posed upon the different ranks of teachers in a distance teaching institution in face of the incorporation of the new technologies. The paper concludes with outlining some leading future trends of distance education at university level, with an emphasis on the new types of support systems needed for students and teachers in distance teaching institutions in the digital age.

Distance education teachers in the framework of the industrial model

Most of the mega distance teaching universities that teach dozens of thousands of students followed the model of the British Open University that was established in 1969. They were a product of governmental planning set to fulfill national missions, mainly - to absorb large numbers of students at a lower cost as compared to traditional campus universities (Daniel, 1996; Guri-Rosenblit, 1999). This goal has been achieved through an industrial model of operation (Peters, 1994, 2001).

The division of the academic teaching responsibility into two separate phases constitutes the essence of the industrial model of distance education. The first phase is devoted to the development of high quality self-study materials by teams of experts. In most distance teaching universities the academic staff work together in team with other colleagues, tutors, editors, instructional designers, television producers, computer experts, graphic production personnel, etc. to develop and write the courses. In

the course team framework, their academic freedom in teaching is clearly reduced when compared with their counterparts in campus universities (Perry, 1977; Guri-Rosenblit, 1999). Their main responsibility is vested in writing and composing self-study courses, and their skills as teachers are relegated aside.

Most of the course developers do not participate in the second phase of the actual learning/teaching process. The underlying assumption at this phase is that large numbers of students study the pre-developed courses through the didactic apparatus integrated into the self-study materials, and as the number of students increases, the cost per student decreases. The sheer size of distance teaching universities disconnects most of their senior academic staff from the essential interaction of learning. The teaching responsibilities are distributed between senior academic staff and other actors that participate in the teaching of the academic courses. Distance teaching universities were bound to require categories of staff which have no counterpart elsewhere.

Most of the distance teaching universities have recognized the need for general support services and devoted many resources to set them up. If the early 1970s were taken up with the quest for effective modes of course design, interest in the 1980s shifted to the design of student support environments (Mills & Tait, 1996). The distance teaching universities show, without the slightest doubt, that to deal effectively with large numbers of students from widely different backgrounds, it is indispensable to reinforce teaching and learning by efficient interactivity between students and tutors, and to provide efficient support services by a battery of professional staff. Since the late 1980s a growing literature has developed which criticized the one-way linear industrial model and stressed the importance of social interaction with both peers and teachers/tutors/counselors (Hamilton, 1990; Rumble, 1992; Evans & Nation, 1993; Paul & Brindley, 1996). In many countries initiatives have been taken to increase the number of active study centers where social exchange and interactive learning can take place (Mills & Tait, 1996). Student support services are costly. To some extent they go counter to the drive for cost effectiveness in distance teaching (Guri-Rosenblit, 1999). The new technologies provide feasible solutions to enhance student support and interactivity in distance teaching settings, as discussed further on.

An important question which emerges from the issue of the distributed teaching responsibility between many actors is: Who are perceived as teachers or instructors by students? Are they the lecturers who planned and developed the self-study materials with an appropriate didactic apparatus? Are they the course coordinators or the maintenance course team personnel (wherever they are other than the course developers themselves), responsible for monitoring the whole process of teaching, setting and checking exams and assignments whilst being available for students' queries and questions? Or are they the tutors or personal tutors who are in close and frequent contact with the students throughout the learning process? This question is neither trivial, nor simple to answer.

From the point of view of a distance teaching university as an organization, self-study materials replace the lecture in conventional universities (Holmberg, 1995; Keegan, 1986, 1993; Moore & Kearsley, 1996). Professional and lower academic ranks which participate in the development and teaching stages are seen as support staff, but by no means are they regarded as substitutes for lecturers. The *venia legendi*, the right to teach at a university, is vested in the written materials. But students, as well as the teaching and professional staff in distance teaching universities, have been socialized within conventional settings, where the person who is in direct contact and dialogue with the students is perceived as the teacher, and all other means, such as books and additional media, are looked upon as auxiliary devices. This basic and profound socialization which evolves from early childhood through the adulthood gives rise to an interesting paradox in distance teaching universities which offer their students ample opportunities for interaction with tutors and other academic staff in regular face-to-face tutorials and seminars or in virtual settings. The more interaction takes place between students and between tutors, counselors and course coordinators, the less obvious is the responsibility of senior academic faculty in the real phase of teaching and learning. This paradox becomes more acute in the digital age.

Distance education teachers in the digital age

The new ICT are most attractive for distance teaching. They have the potential to overcome three major problems of traditional distance education: to rescue the isolated students from their loneliness by providing interaction with teachers, tutors and counselors, as well as with other peer students, throughout the study process; to provide easy access to libraries and other information resources, which was nearly impossible in the past; and to update self-study materials on an ongoing basis. But the application of the ICT by large distance teaching institutions requires a major restructuring of their whole operation, and an immense investment in setting up a totally new infrastructure for developing and delivering their courses. Distance education as provided by the large distance teaching universities and e-learning are based on two different teaching/learning paradigms. While the industrial model of distance education is based on teaching large numbers of students by a handful of professors, most of whom do not communicate with the students at all, efficient e-learning encourages the direct interaction between a small number of students with expert teacher/s (Collis & Moonen, 2001; Littleton & Light, 1999).

In theory, the possibility of enhanced communication in distance education between the senior academic faculty and students is enabled by the new technologies, but its actualization is much more complicated to achieve. Small numbers of faculty are unable to communicate with thousands or even hundreds of students. Most, if not all, large distance teaching universities cannot afford to hire many more academics in order to facilitate student-professor interaction (Guri-Rosenblit, 2003). A much more elaborated teaching network has to be established which will enable ongoing interaction between senior academic faculty and course coordinators and/or tutors, and between tutors and students in the actual study process of any given course.

Developing countries, in particular, do not possess the appropriate resources and technology to make e-learning available on a wide scale. Bates, who was asked by the 'International Institute for Educational Planning' of UNESCO to recommend national strategies for implementing e-learning in post-secondary education in various parts of the world, concluded that: "Those countries that are not yet ready for the knowledge-based economy are probably not yet ready for e-learning" (Bates, 2001, 111), and he suggested that those countries with large numbers of students unable to access later years of secondary or higher education should adopt the industrial model of distance education, that provides the best route for mass education, rather than engage in designing e-learning systems.

Also in the domain of information access the mega distance teaching universities encounter more difficulties as compared to their conventional counterparts. Their egalitarian philosophy that requires them to provide equality of opportunity to all of their students and their catering to large numbers of students, many of whom lack the ability or opportunity to reach Internet facilities and information resources, hinder them from substituting part of their courses, or parts of any given course, by online materials, and by a built-in reference mechanism in the pre-prepared textbooks. This accounts for the duplication phenomenon. Many distance teaching universities develop currently both printed and online versions of courses, and enable their students to choose their preferred mode of study. Such a policy adds on substantial costs to the already very expensive process of developing self-study materials.

The new technologies enable to update the study materials at a relative ease, but at the same time they challenge the overall infrastructure of the large distance teaching universities. In campus universities, the individual lecturer or tutor in any classroom may alter and redefine reading lists, set assignments and study tasks in the light of teaching dynamic. Teaching faculty in most distance teaching universities do not have the latitude whatsoever to make such alterations. The principles of sameness and uniformity apply to assignments and exams as they do to content. In order to employ flexible update mechanisms, the distance teaching universities have to redefine and restructure their overall teaching mechanisms.

It seems that in spite of the apparent advantages and merits of the new ICT for distance education, many of the distance teaching universities lack the appropriate infrastructure and necessary conditions, as well as the human capital, to utilize the full potential of the new technologies. To integrate the

electronic media more fully and efficiently into their learning/teaching processes a whole restructuring of their teaching and counseling operation is required, taking into account the contradictory demands put on their academics.

Torn between contradictory demands

Policy makers and academic faculty in distance teaching universities are currently torn between contradictory demands. The quest for appropriate technologies, to improve the quality of distance teaching, lies at the heart of the development of distance education in general, and distance teaching universities in particular. The distance teaching universities feel an urge to lead the ICT integration in academic environments, but at the same time they are forced to acknowledge that such integration bears tremendously high costs, and requires a redefinition of their operation. The senior academic faculty are still required to devote most of their efforts to develop self-study courses, but nowadays they are also expected to be involved more in the actual teaching process. Course coordinators, tutors and counselors are torn between their obligation to stick to the content and didactic apparatus of the self-study materials, and their need to be flexible and attentive to differential students' needs in the ongoing interactive communication in the teaching/learning process. The principles of sameness and equity to all their students hinder many distance teaching universities from offering highly sophisticated technological developments that might be used by only part of their students. And the students' need for social interaction with both teachers and other students requires finding a most delicate balance between the functions of physical study centers and electronic communication.

A crucial question as to the ongoing update of the materials is who will be responsible for this update - the developers of the initial course or the course coordinators of the course? And to what extent will the course coordinator and/or the tutors be granted degrees of freedom to update the course materials in the actual study process, and respond immediately to student queries and questions? From a variety of studies, it is clear that most students are expecting the person who directly interacts with them through the electronic media to respond to their queries within a short span of time (Collis & Moonen, 2001; Guri-Rosenblit, 2003; Sarid, 2003). Given that most tutors in distance teaching universities are part-timers, and have neither the knowledge nor the expertise of a full-time lecturer, it is of crucial importance to establish special communication and support systems that enable them to interact with other tutors and with the course developers. There is also a need to provide tutors with continuous in-service professional training and counseling support. In a large study conducted at the Open University of Israel it was found that the tutors are key persons in shaping students' attitudes towards the integration of the new technologies into the study process (Sarid, 2003).

Another crucial task facing the policy makers of distance teaching universities is how to reconcile between the traditional role of distance education to provide economies of scale with setting efficient e-learning study environments. In other words, how to find low cost/high outcome approaches. For many decades distance education has prided itself for providing economies of scale as compared to campus universities, while well designed e-learning environments turn quite frequently to cost more than comparable face-to-face encounters (Bates, 2001; Guri-Rosenblit, 2001, 2003; Ryan, 2002). Such a crucial dilemma requires the heads of distance teaching universities to set new priorities, and redefine the whole organization of the materials' development and teaching.

Furthermore, the evolution of the new technologies and their integration into learning and teaching have changed considerably earlier roles of study centers and support systems of many distance teaching universities. Class teaching at study centers has shifted to different forms of interaction. Many functions of counseling can nowadays be performed by direct interaction between students and counselors through the electronic media. Nevertheless, students still need the social meetings with tutors and other students in spite of the electronic media. A balanced mix of various support modalities, suitable to the national setting in which each distance teaching university operates, is of crucial importance.

Concluding Remarks

The complexity of the ICT and the high costs associated with their implementation require a top-down macro level strategy for their effective utilization. Any serious shift of the existing learning infrastructures in any institution requires an overall institutional commitment, a gradual induction of both students and academic faculty to the new ICT uses, the planning of appropriate support services, and clear financial prospects. Distance teaching universities are obliged to alter their organizational infrastructure and overhaul the management of headquarters, local and regional centers. They are challenged currently to develop teaching and learning systems that are flexible in nature, and respond quickly to changes in subject matter, technology and student clientele.

Distance education at university level will grow in the coming years and will attract new student clientele. It will be provided more and more by mixed-mode institutions and consortia in addition to stand-alone distance teaching institutions. It seems that in spite of the growing competition between distance education providers, the status of the mega distance teaching universities will remain strong, and their main mandate will continue to be - to widen access to higher education by reaching out to students who cannot attend or gain access to conventional universities for a variety of reasons.

The expansion of higher education implies the inclusion of less privileged students within its circles. Unprepared students from disadvantaged backgrounds will most assuredly need sophisticated and elaborate assistance in the study process. Many distance teaching universities have developed throughout the years first rate tutorial and counseling services, personal tutors, tutors, tutor counselors, intensive tutorials, seminar settings, summer and residential schools, and campus-like environments (Mills & Tait, 1996). The nature of student support systems will change in the future and will utilize the wide range capabilities of the new technologies. Not only students in distance teaching universities, but also the academic faculty of all ranks need ongoing professional and social support in the adaptation process of the new technologies.

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Author

Prof. Sarah Guri-Rosenblit
The Open University of Israel
Department of Education and Psychology
P.O.Box 39328
Ramat Aviv, 61392
Israel
e-mail: saragu@openu.ac.il

THE TWO-PRONGED ATTACK ON LEARNER SUPPORT: COSTS AND THE CENTRIFUGAL FORCES OF CONVERGENCE

Thomas Hülsmann, Carl von Ossietzky University of Oldenburg

1 Introduction

This paper looks at the cost aspects of supporting learners at a distance. Hence the focus will lie on efficiencies rather than quality. However, we do not want to imply that strategies, which maximize efficiency or arrive at minimal average costs by exploiting scale economies, represent distance education at its best. The model serves to identify efficiencies and deviations from the efficiency path. While deviations may well be legitimate, planners should be aware of them.

In distance education students and teachers are geographically separated for most of the time. For this reason the educational process has to be conducted by means of media. Media (and their *capabilities*) have changed substantially in the history of distance education. In earlier generations of distance education, such as in correspondence teaching, communication between teacher and students had been cumbersome, which made it imperative to develop quality materials pre-empting most of the questions students may have. Hence media impinge on the process of teaching and learning in such a way, that, more than in face-to-face settings, content and communication had to be separated. Because of these difficulties to sustain responsive communication at a distance (especially in earlier generations of distance education), there is a marked shift in emphasis away from communication towards a specific instructional design, which involves the student in a 'simulated dialogue' with the text (Holmberg, 1995).

These two fundamental aspects of distance education are reflected in different terminologies. Holmberg (1995) distinguishes between one-way traffic (i.e. 'simulated dialogue'), and two-way traffic (e.g. forms of 'guided didactic conversation', which allows for the necessary feed back loops between teacher and student). Hülsmann (2000) tries to capture the same difference as a one between *internal interactivity* (i.e. the internal dialogue triggered by the specific instructional design of distance education course material) and *external interactivity*, which refers to the communication between real persons most importantly the interactivity between student and teacher). Hence, external interactivity would comprise what Moore & Kearsly (1996) call *student-teacher* and *student-student interactivity* while their *student-content interactivity* corresponds to internal interactivity. Hülsmann also suggests classifying media along similar lines: media which can mainly be used to provide content and facilitate internal interactivity are *resource media*; media which sustain communication, are classified as *communication media* (2000). The distinction between these types of media has obvious economic consequences since they differ in terms of cost structure.

Hence, learners are supported in both ways: (i) by providing them with learner friendly material (i.e. material in which some student-content interactivity is designed) and (ii) by sustaining a line of communication between teacher and learner.

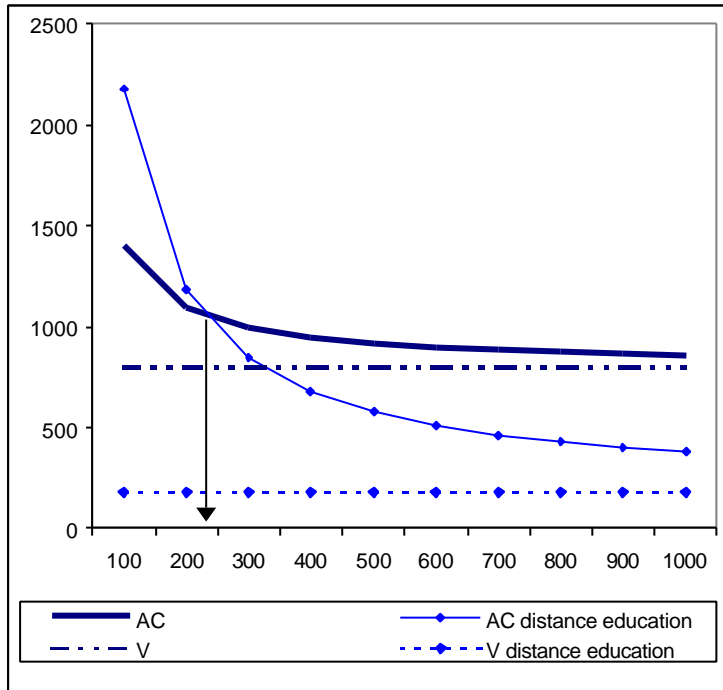
Interestingly, a more canonical definition of learner support explicitly ousts the development of course material from the realm of learner support: "For the purpose of the argument here, the widest definition of learner support will be used. This is the totality of the provision by an institution to support the learner, other than generic teaching materials produced by instructional designers/course producers. To be absolutely clear, where learning materials are produced for numbers of student ..., this is regarded as the academic teaching and is considered to be outside the framework of learner support." (Mills, 2003, p. 104)

Being a nominalist I can live with any definition as long as it is consistently applied, but given the actual purpose of this discussion, i.e. to look at student support in ICT-based distance education, it may be questioned if such an exclusion of improved instructional design from the realm of learner support camouflages the intricate relationships between the two system components.

2 Costing of student support in traditional Distance Education

In the following *traditional distance education* is understood as the generations of distance education up to (and including) the multimedia model of distance education.

Given the centrality of the mathematical model for any type of cost consideration, we shortly parade the standard argument claiming the cost-efficiency of distance education. Recall the *total cost formula*, which reads $TC = F + V \times N$, where F stand for *fixed costs* and $V \times N$ *variable costs*, N representing the number of students and V the variable costs per student. Total costs allow to derive average cost per student by dividing TC by the



number of students. This leads to the *average cost formula*, which reads: $AC = TC/N$ or $AC = (F/N) + V$. The characteristic graph of such an average cost function is a curve which falls asymptotically towards a straight line parallel to the x-axis. *Asymptotically* means, that it approaches the straight line with increasing number of students but never falls below it. *Scale economies* simply means that, with increasing numbers, average costs per students fall. The potential for scale economies is the differential between fixed costs (F) and variable costs per student (V). The flattening of the curve shows the degree, by which scale economies are becoming exhausted.

The figure above depicts two graphs¹, one representing conventional education, one distance education. The traditional argument asserting the efficiency of distance education then is as follows: Even if in distance education fixed costs of development may be higher than in conventional education, as long as the (aggregate) variable costs per student in distance education are lower (and this, it is argued, is generally the case), average costs of distance education eventually will fall below the average costs in conventional education. The arrow in the figure points to the *break even point*, i.e. the number of students, beyond which the average costs of distance education undercuts the costs of conventional education.

To the extent with which we can associate learner support with variable costs per student, it becomes clear, why student support is sometimes regarded as the 'Achilles Heel' of distance education: (i) it defines the limit, below which average costs never can fall, and (ii) it retains the linkage between costs and volume of activities (students to be taught), which distance education prides itself to loosen.

One would have, however, to add some *caveats*. First, all such model considerations may lead planners to think that they could at will adjust all parameters independently, in order to achieve the intended results. In fact, they can make decisions about media sophistication and set levels of teacher-student interactivity. But they cannot simply and independently set the enrolment level. Lowering media sophistication may prevent students from enrolling, which in turn may mean that the intended measure of scale economies cannot be realized and average costs are higher than expected. What applies to media sophistication may also apply to learner support since a supportive learning environment could influence enrolment levels and therefore costs.

¹ We take as one graph the curve and the straight line towards which it falls.

Secondly, we need to distinguish between *efficiency* and *cost-effectiveness*. Efficiency measures usually use as performance indicator 'average cost per student', while cost-effectiveness measures control for academic outcomes and would look at 'costs per graduate'. We know that student support positively influences retention rates and even academic performance (e.g. Gibbs, 2003; Hohlfeld, 2003). If additionally the funding regime shifts from 'per student' to 'per successful student' (Johnson & Barrett, 2003), there is an additional economic rationale for protecting a good student support system even it sets limits for lowering average costs per students.

One further comment: The efficiency path would lead to lower average costs per students. Given the enormous demand for education (and the 'perverse way' of raising unit costs, the capacity of distance education to bring down average costs per student is closely related to its remit to broaden access to education. Especially, in developing countries coping with large numbers is one of the main reasons to turn to distance education (Perraton, 2000). However, planners should be aware that lowering average costs per student in this model is achieved by expanding the system, which, in turn, raises total costs. (This *caveat* to any cost-analysis, exclusively singing the praises of distance education for lowering unit costs, is forcefully developed by Butcher & Roberts, 2004.)

3 A fundamental distinction

The term ICT draws together the two main aspects of the new technologies: (i) *information* processing, retrieval and exchange, and (ii) sustaining *communication* between people at a distance. We classify the respective usages as being of type-i and type-c respectively. Borrowing from Rumble (2003) we define:

- *Type-i applications* offer Computer Based Training (CBT) involving textual, audio, and video course materials in digital format. Content can be downloaded from the Internet or distributed by CD-ROM. No student support is involved.
- *Type-c applications* offer Computer Mediated Communications (CMC) supporting tutor-student and student-student interaction. This support may be offered in the synchronous mode (type-c1) or asynchronous mode (type-c2).
- *Type-i/c applications* combine both CBT and CMC

The distinction between type-i and type-c applications recalls the one made earlier between resource and communication media, which relates to different types of interactivity (internal or student-content interactivity corresponding to resource media, external or student-tutor interactivity corresponding to communication media). However, in the context of ICT-based distance education the difference between resource and communication media becomes increasingly obsolete due to *technological convergence*. While in earlier generations of distance education media could be classified according to their technologies, media capabilities in ICT-base distance education do not split along technology lines². In fact, both applications (type-i and type-c) can be realized on the same learning platforms (or *learning management systems* (LMS) such as *Blackboard* or *Learning Space*). Instead of trying to select appropriate technologies for the best media mix to support learners, we need to define the optimal *educational scenario* (Baumgartner & Bergner, 2004). Educational scenarios are related to educational *interaction patterns*, which then are realized by using tools available within the learning management system. The interaction patterns, in turn, lead to the specific cost-structure characterizing the scenario. Recall what has been said about communication media. The main cost drivers are not the hardware or line costs, but the teachers' time, which means that costs of communication between teacher and learner are largely independent of the specific technology used to sustain it.

3.1 Supporting students through type-i applications

Type-i applications include CBTs to be downloaded via the Internet or distributed as a CD-ROM. CBTs can include simulations, computer marked assignments, video clips, graphics, and audio files. It

² We distinguish with Kozma between media and technologies. Media "can be defined by its technology, symbol systems, and processing capabilities" (Kozma, 1994)

is obvious that this means that producing such material increases fixed costs in a way that makes it difficult to define a ceiling for the fixed costs of development³.

While the good news is that the cost-structure of such type-i applications are compatible with the traditional cost structure of distance education, it is difficult to imagine that the increased fixed costs of development can be compensated by increased enrolments. Devolving the increased development costs to the learners might not be possible since it could counteract potential increases in enrolment, which may come with the bells and whistles of higher level of media sophistication.

The capabilities to support learners at a distance through type-i applications have lifted internal interactivity to new heights. Exploiting such capabilities, however, comes at a cost. Neither is it likely that such costs can be compensated through increased enrolments, nor is it possible to devolve them fully to the student. Assuming that the new capabilities can substitute routine tutorial work, learner support, as communication between teacher and students (external interactivity), comes under pressure. This illustrates that the two main subsystems of distance education, far from being neatly separated, form a system of 'communicating tubes', where developments in one subsystem may increase pressure in the other.

3.2 Supporting students through type-c applications

Type-c applications, synchronous (e.g. videoconferencing) or asynchronous (e.g. online conferencing), sustain communication between teacher and student. In both cases the main cost driver is teacher time.

A model for analysing the cost of videoconferencing has been proposed by Hülsmann (2000, pp. 132-138). Again, the costs depend not so much on infrastructure and hardware, but on the teaching and learning scenario one may want to implement. This is because the *educational scenario* determines the *interaction patterns* and the interaction patterns, in turn, impinge on costs and cost structure: The more interactive, the higher the costs. If videoconference systems are used to lecture at a distance, per student costs can be brought down. But this may be taken as a case of *chained media*⁴, i.e. not making use of the full capability the medium offers. The cost advantages of videoconferencing mainly reside in reduced opportunity costs (less forgone income due to lower loss in productive time due to savings in travelling time⁵). The cost-structure is similar to the one of conventional education⁶.

Asynchronous communication may be conducted as *online conferencing* on learning platforms like Learning Space and Blackboard. To the geographic flexibility of synchronous communication time flexibility is added. Again the cost-structure depends on the educational scenario to be implemented. If discussion drives the course, claims on teacher times are higher than when the learning platform is essentially subsidiary to a print based course. This leads some analysts to complain:

"If there is one thing which researchers and practitioners of on-line teaching agree about, it is that interacting with students in this medium is more time-consuming than traditional campus lecture courses or print-based distance education tutoring. Anyone with experience of tutoring on-line will be considerably more familiar with the over-demanding, emotionally needy, or endlessly chatty student, than with any picture I have conjured up of confident, efficient, focussed learners." (Mason, 2003, p. 96)

Rumble tends to agree, although reports conflicting evidence. Bates considers a class size beyond forty to be reasonable and Boettcher would allow class sizes between 25 and 65 (Rumble, 2001, p. 75). The contradicting experiences reported may be explained by the fact that they correspond to different teaching/learning scenarios, misleadingly insinuating that technology determines the scenario. Below the surface of the same technology, quite different instructional strategies are emerging. You may staff

³ Cf. Hülsmann (2000, p. 17-19) und Perraton & Moses (2004, p.149)

⁴ Seel & Winn (1997, p. 319)

⁵ There is a pile of literature, which claims effects of *time compression* attributable to the use of media (Witte, 1995; Whalen & Wright, 1999; Hasebrook, 1999).

⁶ Some distance educators would not accept the synchronous model as a member of the distance family proper. (Cf. Peters exhortation of the extended classroom in Bernath & Rubin, 1999, p. 162).

courses with teachers and teaching assistants to limit costly expert time. This represents a labor-for-labor substitution. You may fend off communication volume by encouraging peer discussion and allowing for only a limited amount of questions to be put to the expert (groups preparing expert interviews)⁷. However, eventually it will be difficult to administratively (and for economic reasons) limit the demand for student-teacher dialogue made possible by new technologies and enjoying unabated prestige among educators.

Because of the increased ease of communicating at a distance, what applies for student-teacher communication in traditional distance education applies *a fortiori* in ICT-based distance education. The respective cost drivers contribute to rising variable costs per student and re-introduce a cost-structure linking costs to activities. Though it is possible to scale down the fixed costs of developing materials few economies of scale can be harvested (Hülsmann, 2003).

Hence, type-c applications also do not fit into the classic picture of the tutor strictly belonging to a world strictly separated from academic teaching either. In this division of roles tutors are the mere interpreters of expertly developed courses and should not fiddle with the content. There is little to stop the online teacher from tipping the balance from static content which is pre-prepared towards the dynamically generated content of captured dialogue.

3.3 Recovering lost efficiencies

We have observed centrifugal tendencies. ICT-based distance education opens up two distinctively different avenues of development. One emphasizes type-i applications with a tendency to considerably increase fixed costs of development, one emphasizes type-c applications with a tendency to substantially increase variable costs per students. Mixed scenarios are possible as well and more likely to increase than to decrease overall costs. If distance education still wants to cling to its original remit of increasing access and, therefore does not accept that the higher costs price itself out of the market (Rumble, 1999) we need to look for ways to recover lost efficiencies.

Re-purposing, learning objects: The digital format allows the re-use of material once developed and research is underway to itemize standardized *learning objects*. If for example you develop a unit on trigonometry with some interactive applications on sine and cosine, it is possible to store it as a learning object, which, in principle, could be archived, re-used, re-purposed and shared by being integrated into alternative contexts. Until now we have depreciated the fixed costs of course development over fixed shelf lives. We may re-conceptualise and associate fixed costs of developments with learning objects, which could be depreciated not only *longitudinally* along the shelf life of a course but also in a *cross-sectional* manner by re-purposing them in different applications. Some legwork in this direction is already being done by SCORM (Shareable Courseware Object Reference Model). While the potential of this line of development is still unclear, the malleability of course content in digital formats is reflected by the increased tendency of course developers to not set a definite shelf life for a course, but to plan updating the course in a rolling manner.

Strategic alliances: Collaboration at a distance has become technically easier. This facilitates forging alliances between institutions. Such alliances may allow offering courses which, if offered regionally, would, as niche courses, not be economically feasible. Recall, moreover, that distance education has been described as a complex system, comprising a variety of subsystems. The new possibilities to cooperate at a distance suggest that the different system components need not necessarily be hosted at the same institution. Rumble & Latchem (2004) give the most comprehensive account of what could be achieved through collaboration.

"Technology and e-business approaches make it possible for integrated processes of open and distance education to be disintegrated into their constituent parts: curriculum development; content development; learner acquisition and support; learning delivery; assessment and advising; articulation; and credentialing. These processes can then be managed by different organizations." (Rumble & Latchem, 2004, p.134; also Moore, 2003; cf. also Bernath & Hülsmann, 2004).

⁷ Considerations are even underway for billing the amount of learner support an individual student may claim.

4 Conclusion

We began by challenging Mills' definition of learner support, which, consistent with the organizational setting at the OUUK, defines learner support as being separate from course development. We have identified a very old tendency in distance education to shift the burden of teaching and learning away from the realm of learner support to the instructional design of course development. We have argued that it may make little sense to draw such a sharp line between these two major subsystems if we want to gauge the incumbent changes in learner support due to ICT-based distance education, because it is precisely the *technological convergence*, which pierces the membrane between the two subsystems.

We therefore find learner support in ICT-based distance education being subjected to a two-pronged attack. The increased capabilities of type-i applications increase fixed costs of development in a way not easily recovered through scale economies. The costs are not for nothing. They reflect the enhanced capabilities of type-i applications. It is not unlikely that distance educators do what they have done in the early days: shifting the burden of the teaching and learning process towards highly interactive courseware. The high costs of investment create the need to do so and the high capabilities of the type-i applications lend a certain credibility to this strategy. In any case, it puts learner support as we know it (or as Mills defines it) under pressure.

The second prong of the attack puts traditional learner support under pressure by blurring the lines between course development and teaching and learning. The online tutor does not stay the mere interpreter of the holy writ issued by the course developing experts; he or she may add to and/or shape the content of the course. This is especially the case when online courses are no longer based on specifically developed course materials but draw from available resources (journals, library books, and in most cases, if possible, provided online). - Given this two-pronged attack it is unlikely that learner support will remain unscathed.

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Author:

Thomas Hülsmann, MDE Faculty
Carl von Ossietzky University of Oldenburg
Center for Distance Education
26111 Oldenburg/Germany
thomas.huelsmann@uni-oldenburg.de

LIVEFORUM – A NEW APPLICATION FOR SUPPORT AND SYNCHRONOUS COMMUNICATION

Stefanie Brunner & Kristin Ilse, Carl von Ossietzky University of Oldenburg

1. Preface

While developing our E-Learning Course for the first time, new ways of providing support were discussed. ‘LiveForum’ – our application - combines the advantages of the two communication tools ‘chat’ and ‘Threaded Conferencing’. Thus, it was possible to provide synchronous and structured conversations, which allowed quick and broad support regarding technical, expert, social and emotional concerns. This led to high motivation among participants and a constructive work atmosphere was constructed through LiveForum.

2. General conditions

In early 2003, the authors, in cooperation with Prof. Dr. Ing. Jens Windelberg, Department for Town- und Regional Planning at Oldenburg University, developed an e-learning course. It was our first experience with e-learning support. The topic of the course was “Basics of Urban Development and Town Planning” (BUTTOP). About thirty (prospective) planners from sixteen different countries participated. Communication between participants from e.g. Bhutan, Chile, Nepal, Syria, South Africa, Ethiopia, Tanzania and Oldenburg (Germany) was professional and effective. Twenty-one completed the course successfully and received a certificate from the Department of Public Planning at Oldenburg University. BUTTOP was listed in the **GDLN**¹ and some of the students became aware of our course due to that fact. Other participants were individuals associated with partner universities, partner organizations, offices or the worldwide operating **GTZ**².

The course software used was LotusNotes Learning Space. The Lotus replication feature allows offline work most of the time and thus substantially reduces the costs of being online. This makes the program interesting for participants in countries where an internet connection is not necessarily common. The functionality and reliability of this system (infrastructure and platform) have been tested and proven in numerous online programs in both higher education and professional development. It is continuously secured by a core team of four experts at three centres for distance education in Northern Germany (cf. homepage of DESDe).

Originally, it was planned to hold three video conferences - at the beginning, the middle and the end of the course. This could not be realized because many participants did not have access to the necessary facilities. Due to this circumstance LiveForum, which was developed at the same time as the course, became much more important for the instructor team and the participants.

The E-Learning Course BUTTOP starts again in February 2004 and a second evaluation of the application LiveForum will be conducted afterwards to prove our results.

3. What is ‘Chat’?

Chat – or chatting – is a real-time, simultaneous communication between two or more people via the World Wide Web. It allows any number of logged-on and normally registered users to talk online via a network. Nowadays, this type of communication is very popular. Often, more than 100 persons are

¹ Global Development Learning Network of the Worldbank

² Deutsche Gesellschaft für Technische Zusammenarbeit: The GTZ is a government-owned corporation for international cooperation with worldwide operations

online concurrently. Each posted message pops up instantly, always at the end of all the written communication, making it a kind of ‘running’ text. The user has to read every new message to decide which ones concern her/him. To control the unavoidable chaos to some extent, more than one chatroom is usually offered. There are rooms for special topics, and others that are absolutely private, with restricted access only to those explicitly invited by the user who created them. Under these conditions, and with certain rules such as distinct tasks and moderation, it is favoured by some instructors: “To get structured discussions within a chat one first needs clear conceptual guidelines and secondly good moderation.” (C. Bremer, 1998, translated by the authors). This effort, which seems to be necessary to make chat a useful communication tool for E-learning Courses puts many instructors off.

This tool, which facilitates synchronous communication between people from many different parts of the world, was favoured in the formation phase of BUTTOP. It was considered an interesting add-on. The instructor team wanted to get into contact with the participants, but not in the rather chaotic form and without sufficient preparation. It was necessary to modify a regular chat tool or develop a new one.

4. What is ‘Threaded Conferencing’?

In contrary to chat communication, threaded conferencing provides the possibility of structured discussions. “Messages can either be juxtaposed or attached to a preceding message. The level on which threads start are often called ‘main topics’.” (Hülsmann, 2003) The obvious advantages to chat are

- the simplicity of following a conversation’s thread
- the preservation and
- the comprehensibility.

Threaded conferencing is used in almost every web course. It permits a structured discussion with the possibility to track the thread. Some platforms allow the sorting of contributions and answers to their third level (e.g. WebTycho), others (e.g. LotusNotes) allow many more, while chat does not have any option to sort answers at all which makes it more difficult to follow the discussion. “Asynchronous conferencing can be seen as a hybrid medium sharing the communicative interactivity of ‘speaking to each other’ and the stability of the textual medium, which facilitates analysis and invites reflection.” (Hülsmann, 2003)

In fact, threaded conferencing does not mean one has to communicate asynchronously: When two people sit at their PCs at the same time, they may talk to each other via this medium almost simultaneously.

5. LiveForum

5.1 What is LiveForum?

The advantages of chat - synchronicity - and threaded conferencing - structured communication - were combined . on the application’s basic platform and which was provided as a part of Lotus Notes, used to run BUTTOP. It was named “LiveForum”: “Live” because of the real-time communication, and “Forum” because of the structured form for various contributions.

LiveForum looks like any other threaded conference with the important distinction that it can be used synchronously. To read all new contributions, the “F9” key or the “refresh”-button are applied. The new messages, distinguished by a small red star, are listed below the document to which they belong. Not only the participants who take part from the very beginning of a session, but those who log in later are also able to get an overview of all the conversations and facts almost immediately. One can easily look at all the postings made until that time. The participant enters the LiveForum and sees immediately what is important for him or her.

Other than chat, LiveForum does not list single users' names or the number of others at a glance. Nevertheless, the overall user-friendliness of the LiveForum is secured by other options. Among others, these are:



Screenshot.1: Toolbar of "LiveForum"

- Index function: Search for certain words in all contributions of a session
- Show Thread function: Contributions of a special thread are shown
- Collapse function: Overview of all main topics
- Expand function: All contributions (titles) made in a session

5.2 Why LiveForum for our course?

When joining a non-virtual course, the participant has a contact person with whom s/he can share her/his problems, concerns or wishes, either personally or at least over the telephone. In BUTTOP, these options like in many other e-learning courses (cf. Mündemann, 2002) were not given. However, personal contact with an instructor is very important for successful support. Normally, the only way to exchange information is communication via e-mail and is not always efficient. . In general it takes considerable amounts of time to answer all questions, mailboxes are always close to full, questions can't be asked back as quickly and many participants are reluctant to write the instructor about every problem they may have.

A much more efficient approach is setting up an online consultation hour. In asynchronous communication or discussions it often takes hours or days to reach a result. Regular meetings in which every student can take her/his questions and get an immediate answer from other students or the instructors is more satisfactory for both sides. Additionally, one question/answer, e.g. about a technical problem which is relevant to several persons, can be conveyed to all at once. Furthermore, synchronous communication is of high importance with regard to motivation: "Practical experience in our presentations shows that a combination of synchronous and asynchronous parts is more motivating for participation and beneficial for the group process." (Bremer, 1998, translated by the authors)

As mentioned above, LiveForum is not only synchronous and structured communication between instructor and learners, but also between participants. It may compensate the missing element of having social contacts, which can take place after a traditional course. It may also take on the role of side conversations, which are considered to be of high importance. Altogether, this may build the bridge from the single student to forming a group identity.

In a nutshell, targets focused on by using LiveForum were:

- To support of the participants in important fields (professional, technical and emotional) by direct contact and immediate responses
- To gain deeper and more qualified knowledge of the problems participants are confronted with while working on BUTTOP (especially professional, but also technical and affective issues)
- To facilitate the formation of a self-supporting and self-motivated work group
- To encourage the transfer and exchange of information among participants
- To create a convenient and positive work atmosphere for and between the participants and instructors

Of course, real-time communication also has its problems, even if it is combined with the advantages of structured conferencing:

- Technical and financial resources: Can everyone afford Internet connections and for what amounts of time?
- Time zones: Is there a time window when all participants could join the LiveForum?

6. Practical experiences

6.1 Background and general conditions

The instructor team met regularly each Thursday at 4 pm MET in one of the multimedia rooms of the Centre for Distance Education at the Carl von Ossietzky University in Oldenburg to supervise the LiveForum. During our first meeting on February, 13th 2003 we chatted with two Syrian, three South African and one Chilean participant. Participation was voluntary and was considered an additional offer within the course. Two other forums for communication were also provided: the 'CoffeeBar' for additional socializing and literature tips and the Conferences for professional discourse.

The highest participation was on May 5th with 14 chatters, the smallest on May 22nd (a public holiday) with 3 participants. On average each meeting was attended by seven to eight chatters. Some sat at their computers at home ("I am working at my home. I am hearing the snore of my family member, because it is 10.15 at night. I am relaxing with you." (Personal communication, D.A., Nepal), while others were still at work or at their university. Actually, the time frame was compatible with all participants' time zones.

6.2 LiveForum Topics

We had not planned on moderating LiveForum, so we did not know where the conversations would lead. It turned out to be both smalltalk and professional conversations. Topics were diverse and included (sometimes in their native languages) eg.:

- Personal messages:
 - Organisational: „I may pop in again for a few minutes later, but it's my wife's birthday and I'm taking her out to a restaurant." (D.T., South Africa).
 - Social: Many participants talked about their daily lives.
- Professional discussions about course contents
- Topics concerning philosophy, architecture and politics. One Syrian participant spoke about their orthodox Easter celebration, which takes place one week later than our's („there are lots of Christians in Syria, about 20%. [...]I've done some biscuits with kids today. Some are burned while I am chatting." (R.A., Damascus).

6.3 Formal aspects

Technical problems with internet connections or different writing speeds, which might have led to interruptions in the discussions, did not turn out to be a big problem for the communication process. The conversations were mostly fluent. Sometimes a few minutes passed before an answer was posted, but the thread was rarely cut off. Furthermore, this speed made it possible to pursue or read other conversations as well. Overall, we noticed that the conversations did not stay on the level of a simple „how are you“ but actually encompassed a wide variety of course relevant topics.

During the four months of the course some formal and content related suggestions for improvement emerged. One participant wanted us to prepare two topics for discussion in each LiveForum in the way mentioned by Bremer above. We decided against this proposal, because the organised discussions were reserved for the online conferences. The LiveForum was to be open for less formal conversations as well. Another proposal was to list all LiveForum users logged in at the time. This only came up at the end of the course and there was not enough time to realize this.

6.4 Psychological Aspects

As mentioned above three videoconferences were originally planned, but could not be implemented due to access issues. LiveForum compensated for some of the expected outcomes:

- It allowed for familiarization with the participants' different worlds. Thus, it was possible to imagine how others who were at a distance lived, felt and thought.
- It emotionally involved participants on three levels:
 - Personal: The discussions on the war in Iraq, which started while our course took place sparked a keen interest. During that time in particular we noticed that the synchronous communications in our LiveForum let us feel spiritually connected to the people "at the other end". All participants expressed their sympathy and concerns for peace to their Syrian colleagues. While BUTTOP took place, some started to e-mail regularly with one other and the desire to stay in touch and continue their communication with regard to personal matters as well as course contents, was expressed. Some even promised to visit each other.
 - Professional: On the one hand the discussions provided new ideas and motivated to continue and learn more. On the other hand LiveForum provided the simple knowledge that others too were engaged in the topics and tasks of the course, and this facilitated active participation.
 - Social: The weekly meetings contributed essentially a positive groupfeeling which was expressed e.g. in the fact that at some point the participants nicknamed themselves „Buttups". This marked them as members of what social psychologists call the 'in-group' and additionally showed their wish to belong to the group.

6.5. Evaluation

Evaluation of the LiveForum at the end of the course showed that its implementation was rated as positive or important by nearly 80 per cent of the participants. The feedback on the course was positive in every way and our initial doubts were not confirmed:

- In spite of partially poor internet connections in Syria and South Africa, the participants did not stop logging in and attending the next meetings. („I'm looking forward to join our next chat session", R.A. Syria).
- Although most participants studied or worked during the day, had family obligations, and needed to work through the contents of the course, more than half participated in the LiveForum at least once. Six participants attended over half of the meetings and three were present almost each time. Time difference did not seem to be a problem for most, even though some had to chat rather late in their evenings. Others were still at work at the fixed time, and requests to meet later were made. We decided to prolong the meeting by one hour and this expansion proved to make sense.
- The weekly meetings facilitated the positive groupfeelings expressed in the fact that the participants referred to themselves „we Buttups".
- The Forum provided the possibility to motivate one another through their interest and enthusiasm for the course topics and even lead to arranging joint projects.

7. Transferability

After this experience, which was very gratifying and not explicitly expected, the question to what extent the LiveForum can be transferred to other courses within other learning management systems (LMS) remains. Technical aspects do not seem to present problems regarding the transferability to other platforms as a forum tool is available for almost every platform and a few modifications should be sufficient to integrate a LiveForum. Personnel requirements are low because the Forum demands only a few hours of time per week. And, it is possible to spread the supervision of the LiveForum among several tutors. These can complement one another while chatting – with the advantage of a single tutor not having to be responsible for the whole group – or they can take turns weekly.

Technical or personnel constraints should not be expected when applying LiveForum.

8. Conclusions

Our experiences with the „LiveForum“ have shown that this application can be useful in many ways. Combining synchronous communication with structured conferencing offers many advantages: it allows for quick and broad support with regard to technical, expert, social and emotional concerns and can lead to high motivation and reduced withdrawal rates among participants, which is often due to lacking support. Weekly synchronous communication contributes to the feeling of belonging to a group and motivates those who were active to demonstrate steady work habits, which in turn had a positive effect on the whole course group. Altogether, it strengthened a constructive work atmosphere and the possibility to re-read the discussions' contents enhanced comprehensibility and stability in the ongoing learning process. We were able to convey that we took the participants' worries and problems seriously and that it was important to solve them quickly.

The application "LiveForum" can be installed with little effort. The implementation itself requires the teacher/tutor to be available at certain appointed times for only a few hours a week instead of having to deal with nearly full mailboxes and questions at all possible times of day. The user does not need additional technical knowledge for LiveForum. It is assumed that LiveForum can be transferred to any other learning management system without problems. All things considered LiveForum passed its baptism of fire.

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Authors

stud. Dipl.-Psych. Stefanie Brunner
Centre for Distance Education
Carl von Ossietzky University of Oldenburg
D - 26111 Oldenburg
Stefanie.Brunner@mail.uni-oldenburg.de

stud. Dipl.-Landschaftsökologin Kristin Ilse
Environmental Studies, Faculty V
Carl von Ossietzky University of Oldenburg
D - 26111 Oldenburg
Kristin.Ilse@mail.uni-oldenburg.de

SUPPORTING THE LEARNER WITH AN INTEGRATED CONSTRUCTIVIST COURSE DESIGN THE CASE “MEISTERNETZ”

Heinrich Dieckmann, Egbert Andratzek & Gilbert Schwartmann
Studiengemeinschaft Werner Kamprath Darmstadt GmbH

The changing needs of learners in professional education

Innovative course designs are the only valid response to the changing needs of learners for support in professional education. Learners are becoming increasingly self-conscious. They have clear ideas about the required skills and qualifications. “Modern” learners are interested in developing skills and competence which can be applied instantly to their professional life.

This switch of expectations is accompanied by ongoing changes in business. Companies of every size attach growing importance to employing “flexible specialists” in their work force. These “flexible specialists” combine general management skills with profound, specialised knowledge. The ongoing progress in technology and the rapid rise of pressure in global competition cause complex problems and challenges in daily business life. The success of a competitive company depends on its workforce’s competence concerning problem solving (DREWES/SCHOLZ/WORTMANN 2000, p. 11). Therefore, qualifications in areas like project management, co-ordination, communication, etc. are key qualifications and have to be intensified and broadened. These “general” skills need to be combined with a more specialised expertise, which is required in many fields of business (BALLIN/BRATER 1996, p. 34 and FALK 2000, p. 8).

In short: Modern companies are learning organisations. But their ability to provide learning depends on the ability and (intrinsic as well as extrinsic) motivation of their employees to learn in a self-directed way.

For distance learning the changing attitudes towards education have several consequences: First of all, new pedagogical concepts are necessary to meet the changing needs. Second, the distance learning company is no longer an “authority”, telling its students what to do. The provider of distance learning courses is becoming a “partner” of its customers and guides through the learning process (SÚILLEABHÁIN, COUGHLAN 2003, p. 50). Third, the distance learning company has to adjust its learning materials to the needs of the different target groups. In future, this *target learning* could be the main competitive advantage of distance learning.

Traditional, broad course designs cannot fulfil these new requirements in terms of qualifications. New, “intelligent” course concepts are the only possible response to the current challenges. These concepts have to combine the mediation of “soft skills” and the access to a current specialised knowledge base, which enables self-directed learning. The theme of authenticity reaches a higher importance: “Higher Education today must not only incorporate an understanding of adult development (...) but also an understanding of and promotion of the relevance of its courses to the worker in the workplace.” (SÚILLEABHÁIN, COUGHLAN 2003, p. 50).

Consequently, a new type of distance learning is evolving: It is based on an action-oriented model, whose traditional media (print, seminars, workshops, etc.) is enriched by virtual elements. In this model, the learner plays the role as *subject* of his/her learning process; he is no longer an “*object*” of a pre-defined learning process (DIECKMANN 2002).

The new type of learners and learning scenarios implicates also a new organisation of student support services. Student support services can be divided into “learner support”, which is related to the facilities of a distance learning academy, and into “learning support” (KEEGAN 2003, p. 1). In our

following explications we focus on the latter type, the learning support. Following KEEGAN, learning supports “lists the assistance provided by the institution in the actual process of learning to ensure that the learning tasks are performed successfully.” (KEEGAN 2003, p. 1). This definition implies, that learning support can be provided personally (by tutors) and via learning media.

With its “Meisternetz” project, the *Studiengemeinschaft Darmstadt* is currently developing a modern, integrated course design, which fulfils the described requirements concerning professional education. The “Meisternetz” project aims at the creation of an integrated content and communication model, which supports the learner by guiding him through all phases of an authentic problem solving process as it could happen in professional life. This support consists of tutorial advice, peer-to-peer communication and a well thought-out arrangement of contents.

As we will show, course design and learning support are interlocked. In this article we do not want to discuss the highly controversial position of THORPE on the break down of the separation between course design and learner support as a consequence of collaborative learning scenarios (Keegan 2003, p. 4 and Thorpe 2002, p. 106). But at least in parts the “Meisternetz” project can also be seen as a practical survey on THORPE’s argumentation.

The “Meisternetz” project

In its “Meisternetz” project, the *Studiengemeinschaft Darmstadt* is currently developing “virtual learning modules” which will be used within the course for the degree “Industriemeister Metall” (IHK). During recent years, the tasks of the “Industriemeister” in daily business life have changed significantly. With the introduction of flat hierarchies the “Industriemeister” has to act as a responsible team leader and as a “manager in the production area” (DREWES/SCHOLZ/WORTMANN 2000, p. 8). Hence the curriculum of the qualification was modified in the year 2000. The teaching of action-orientated skills in the fields of technology, management and organisation now consists mostly of the qualification process. This process lasts for at least two years.

The “Industriemeister Metall (IHK)” can be seen as a very profound example of the changing roles of employees in the modern economy, as it was characterised above.

Subsidised by the German Ministry of Education, the *Studiengemeinschaft Darmstadt* has been working together with several regional Chambers of Commerce on the “electronic convergence” of twelve situational learning exercises since spring 2002. These exercises – used in the final part of the course for Industriemeister Metall – consist of authentic problems and cases of professional life in the metal industry. They do not just allow, but require, multiple solutions.

The Constructivist Approach

The Meisternetz exercises follow a constructivist approach. Learning – based on the constructivist paradigm – means “perceiving, experiencing, acting and communicating” (KLIMSA 1993, p. 22). Instead of “dill and practice” models the imparting of “skills and strategies” (HONEBEIN/DUFFY/FISHMAN 1991, p. 106) is privileged. From a constructivist point of view “learning is seen as a construction of meaning in interaction with others (teacher and fellow students). Knowledge is constructed in social groups.” (REKKEDAL, QVIST-ERIKSEN 2003, p. 15).

This means for instance in our case: Instead of only learning several techniques of welding, the learner should be able to analyse total problems: For example, which consequences a certain type of welding has on the costs, production time or qualification needs in a special context. The special, technical expertise is still needed, but transferring own knowledge onto new situations is more valuable. Another key feature of each pedagogical constructivist approach is the paradigm of “situated learning”. This situativeness can be expressed e.g. by...

- the representation of a complex, social reality (instead of abstract content)
- the authentic activity of the learner (instead of the activity of the teacher)
- the presentation of multiple views on problems (instead of providing one simple solution) (Kerres 2000, p. 79).

One important aspect of the constructivist learning paradigm is furthermore the confidence in the abilities of the learner to direct himself through his/her learning process.

Self directed and situative learning does not only provide a high degree of didactical interaction. It has also the chance to facilitate an exploring type of learning – and simultaneously to provide a comprehensible learning exercise and arrangement (ANDRATZEK 2002).

In the daily life of pedagogical practice these requirements of constructivist learning models lead to enormous problems in designing courses and curricula. The postulation of the sovereignty of the learner has often led to unorganised, open learning environments, which asked too much from the learner. “Everything is possible” seemed to be the motto of these learning environments (as on the other side the traditional “drill and practice” paradigm of behaviourism dominated e-learning) (MÜHLHÄUSER 2003).

On the contrary, we believe that a constructivist course model needs a certain balance of self-directed, “open” learning and – on the other side – the arrangement of a certain “thread”, the provision of a systematic learning environment with didactically edited materials (DIECKMANN 2002).

The learner needs support for his/her methodical procedure and for applying the “right” knowledge. This support has to be given by media and personal tuition (cp. to table 1).

Action oriented learning requires an arrangement of learning media based on the methodology of the learning process. This arrangement is still provided by the distance learning institution, but is in a self-organised, self-directed and self-initiated way by the learner.

Hence, the use of new, electronic media in this model is due to its pedagogical and didactical benefits – and not caused by their mere technological fascination. The learner takes over a new, active role in his/her learning process. The materials and didactical arrangement has to provide him with hints and orientation.

But let’s get precise with a look at the “Projekt Meisternetz” as an example of a modern, constructivist course design based on learning media.

“Material”	“Personal”
<p><i>Traditional:</i></p> <ul style="list-style-type: none"> ▪ Administrative services for learners (e.g. marketing, shipping, etc.) ▪ Printed learning material ▪ Seminars, workshops 	<p><i>Traditional:</i></p> <ul style="list-style-type: none"> ▪ Customer support ▪ Content manager ▪ Distance learning teachers (to be reached by phone, traditional mail, etc.) ▪ Learning groups
<p><i>Added “electronic” components:</i></p> <ul style="list-style-type: none"> ▪ Learning Management System ▪ Personal Computer (connected to the web) ▪ Virtual Learning Modules 	<p><i>Added “electronic” components:</i></p> <ul style="list-style-type: none"> ▪ Tutors ▪ Collaborative groups of learners ▪ Moderators of workshops and seminars

Table 1: Material and personal components of support for learners in innovative distance learning course models. Source: ANDRATZEK 2002 (modified).

A flexible course design with real life connections

Following a constructivist approach, the Meisternetz learning modules are split into eight sequences (“learning phases”). These phases represent the typical way of solving a – real life – problem (first the information, followed by planning, executing and self-controlling, etc., cp. to figure 1).

Each “Meisternetz” module consists of a situational learning exercise. These exercises always contain a mixture of the knowledge fields “Technology”, “Management” and “Organisation”. These contents

have to be applied to new situations. For instance, the learner has to develop a new production system. To do so, the student should consider the implications of his/her solutions and proposals on other aspects such as costs and workforce planning. The learner has to apply his/her own experiences and knowledge to the unknown situation which is shown in the exercises and learning modules. The learner also has to acquire new appropriate standardised educational contents to solve the exercise and to create new knowledge.

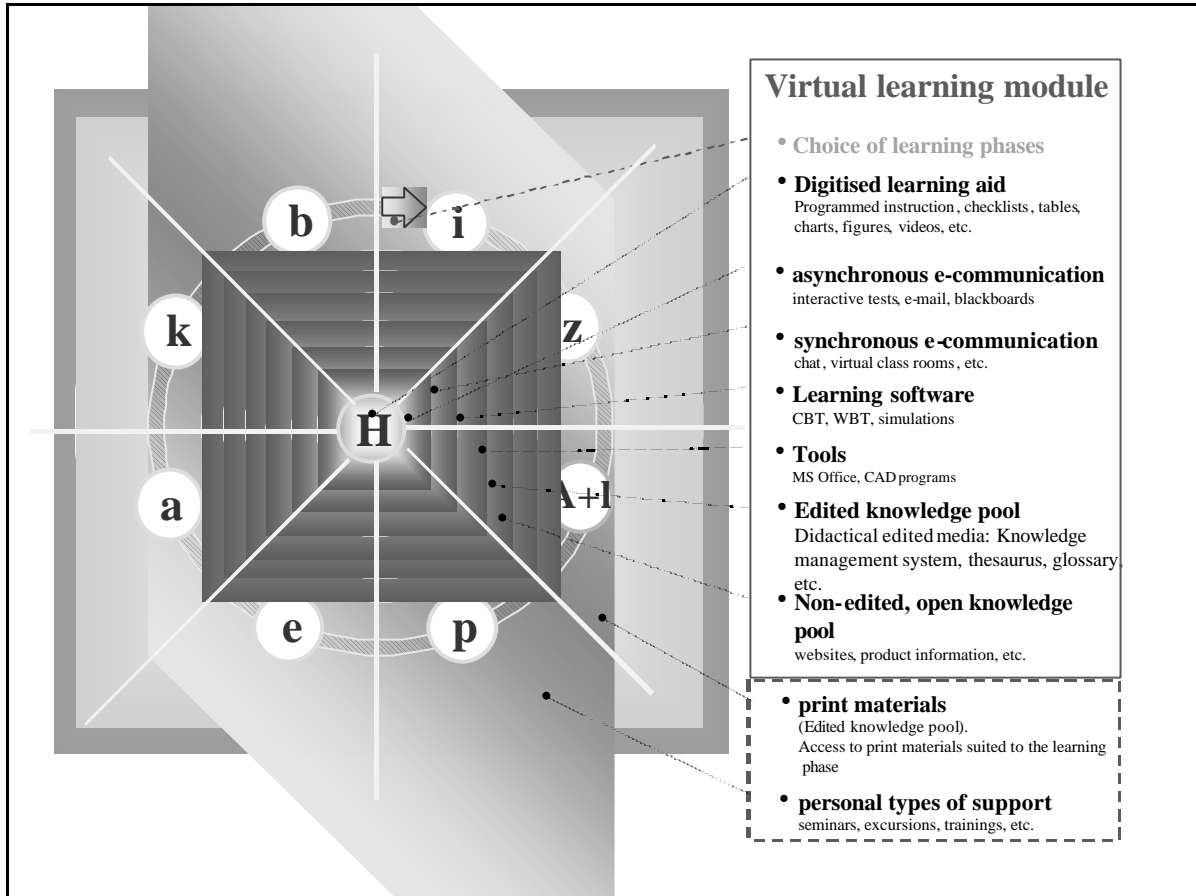


Figure 1: The arrangement of media support in the Meisternetz learning modules. In the circle the eight learning phases are represented: (i) information, (z) identification of objectives, (a+l) analysing and learning, (p) planning, (e) decision for one possible procedure, (a) compilation of the solution, (k) controlling and (b) evaluation of the solution. Source: ANDRATZEK 2002 (modified).

Learning does not take place in separated subjects, but in combining these subjects. The target of this learning is to create knowledge used for solving problems in daily business life. Only if these requirements are met, can the above-mentioned interdisciplinary key qualifications be developed.

The core of each module is a multi-media *Web Based Training (WBT)*, made by Macromedia Flash and Authorware. This WBT plays the role of an “electronic” trainer, which guides the participant through his/her learning process. The WBT provides the learner with information about the exemplary situation, informs him on the tasks to do and gives hints concerning planning possible solutions. In several situations, interactions and tests are designed to help the learner to find “his/her way”. Of course, the WBT will never take the place of a human tutor. On the contrary – the human and electronic trainer complement one another.

The level of the Meisternetz exercises is highly sophisticated and requires high competence regarding self-directed learning. This competence is often trained only rarely in the Meisternetz target group “Metal workers”. Hence, the learning support has to provide all the information needed to solve the exercises *and* has to sustain the process of self-directed learning. However, the Meisternetz modules provide their learners with a comprehensive support. This support consists of

- Media (e.g. printed material, books, product information, internet resources, etc.)
- Peer-to-peer communication (in clipboards, chats, etc.)
- Tutorial support

All these components of support are specifically designed for each of the eight phases. In every step and situation of his/her learning process, the participant can rely on support through media, communication with other participants and tutorial advice. This structure is particularly useful: First, the needs of a learner in different stages of his/her learning vary. For instance, at the beginning of an exercise, the learner needs more hints from other participants and additional media support. However, in later stages, the role of the tutor becomes increasingly important. For example, the learner needs help during the development of different strategies for the solution of the exercise. The integration of content and support offers an optimised learning arrangement, which still allows the participant to navigate on his/her own path of self-directed learning.

Second, the structuring of the support by phases has also some organisational and technical advantages for the distance learning academy and its tutors: By canalising requests and articles in web-clipboards, tutors can respond in a more detailed way on the topic. Moreover, crowded clipboards with entries about hundreds of topics, which confuse tutors as well as participants, can be avoided more easily.

Through a technical connection between WBT and the learning management system (LMS) “waveLearn”, the learner finds all the support he needs listed on the LMS whenever he is working on his/her WBT exercise.

In the following chapter we want to take a closer look at the different components of support.

Supporting the learner in the “Meisternetz” project

Media

The roles of the different media in this distance learning arrangement are changing. The traditional print material will maintain its position as a supplier of standardised knowledge. Also presence workshops and seminars will not vanish. But the electronic media with their potentials in the fields of communication and interaction could find their role as a combining element of the various other learning media and materials.

The following “media” are used:

- The WBT as a guide through the learning process
- The traditional print material as a supplier of standardised knowledge
- Software tools (e.g. MS Office, CAD, etc.) to develop his own solutions
- A complementary, prepared knowledge pool with original, authentic company information, brochures, internet resources, CBTs/WBTs etc.
- An “open” knowledge pool, which is in fact the open learning environment, needed in every constructivist learning arrangement.

As first evaluations of the “Meisternetz” learning modules have already shown, the combination of different media seems to be especially well accepted by distance learners. Additionally, the use of software tools to create solutions is an important part of the constructivist concept.

Peer-to-peer communication

Social interaction is one key feature of the constructivist paradigm. Therefore, the organisation of a community of learners is one of the main tasks in the “Meisternetz” project. In different context and organised by “phases”, the course participants can use attended forums, chats and virtual class rooms.

Additionally, the partners of the “Meisternetz” project will build up a “community of practice”, which will serve as a meeting point for tutors to exchange their experiences. With this community of practice, practitioners from distance and presence learning companies are unified. A common knowledge of “modern” teaching in constructivist models can be established.

Tutorial support

The importance of tutorial support increases with the implementation of constructivist, action oriented course models. The frequency and qualities of questions and answers will soar. For this, a motivated tutor is needed, as possible with practical experiences of daily business life. Only “authentic” people can give authentic answers.

For the constant qualification and improvement of tutorial service, the above described “community of practice” will be established.

Of course many problems still wait to be solved during the remaining time until the project ends in September 2004. Especially the proper assessment of the authentic exercises and the building up of a vibrant and popular community of practice needs more research and practice. But with its didactical concept, and its arrangement of different media and tutorial support, the “Meisternetz” project aims to provide a model for a modern distance learning course design. Therefore the Meisternetz learning modules offer an answer to the needs of modern economy for qualified and flexible workers – even in lower and middle management. They could also be a signpost for a new model of distance learning.

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Authors:

Heinrich Dieckmann
Pädagogischer Direktor
heinrich.dieckmann@sgd.de

Egbert Andratzek
Fachbereichsleiter Technik
egbert.andratzek@sgd.de

Gilbert Schwartmann
Entwickler Projekt Meisternetz
gilbert.schwartmann@sgd.de

Studiengemeinschaft Werner Kamprath Darmstadt GmbH
Ostendstr. 3
D-64319 Pfungstadt
Germany

TRAINING WHILE WORKING: DESIGN OF A LEARNER-BASED MODEL

Mario Doria & Rafael Santana, Tecnológico de Monterrey

In order to face corporate challenges where ROI and other measurable effects evaluate training, solutions should make possible to measure the effects of training in the company's processes and results, and not only from acquired knowledge or abilities. To confront the challenges, we need to refocus job training: workloads, geographic dispersion, cost pressures, time and the need to standardize support materials and companywide practices require a revised approach to the training process, from the learner's perspective, their environment and the availability of time and materials, to company's expectations on performance, cost and behaviour.

Training has a different approach than academic learning: in training the emphasis is that at the end the person shall be able to do something, to perform according to standards, to achieve results within established parameters. When the trainees are geographically dispersed, and/or numbers are large, a distance education process is the logical and cost-effective conclusion, if learning materials do not require human direct interaction.

To achieve desired results we require trainees to take control of their learning and to incorporate the learning process into their performance, so that imitation, observation and controlled repetition may result in meaningful learning and successful results, with their intended rewards. When organizations are required to do a perfect job every time, at first try, it is only possible if people that do the actual operations are able and willing to do so, and for this to happen the workers shall be able to learn how to do their work correctly, so that results of training are self-evident to the learner. This "natural" feedback facilitates job enrichment and evaluation.

We are not trying to justify distance education (or knowledge distribution), its viability or possibilities, we are searching for a path to make the learning process more effective and enriching by centring on the person. We reviewed accepted models (Bloom, 1958) and recent favourites (Llano, 1999 and Millán, 1974), the instructional design approach for Internet-based courses (Horton, 2000, Conrad, 2000) and online interaction (Weatherly and Ellis, 2000), to develop a model based on the influence on the person's perception of reality through the senses, where objectives, content and design are the core of the capacity of training to be incorporated into the trainee's intelligence. Our work is based on the work of Carlos Llano, both from his book as from his classroom.

The objectives of our work were to develop a solution to train large groups of workers to perform technical activities according to strict standards, within a short time frame, restricted budget and no loss of quality, measured in terms of actual work performance.

This paper presents the design of the learning model, with results from implemented examples.

Fundamental premises

- Adults are responsible for their own learning, especially in training, but however self-motivated as they might be, the way content is presented to the person and the design of learning and evaluation may define the interest of the person to keep on trying, or to look for other options.
- The core of the learning process is the interrelationship between reality and each individual's perceptions, our responsibility as trainers is to present objectives and content in such a manner that attention keeps focused, and the learner has the perception that he/she is getting something meaningful from the effort.

- Concerning the achievement of specific results, learners shall understand these objectives, and agree to make them become part of their own reality, thus achieving the intended results as part of his “social contract” with the company, in exchange for the expected rewards.

The learning model

The integration of the learning process, centred on the learner, implies that learning is a consequence of the absorption of reality through a person’s will and intelligence. This absorption involves using the senses to collect data, making decisions about which data is useful, applicable or good, leading to comparison with other concepts and other people’s knowledge, its application and integration into the person’s reality, and the acquisition of habits that eventually form character. It is the role of the educator to influence the perception of reality through objectives, content and design, and in evaluation, to assure that learning fulfils the expected objectives.

It is important to note that the learning concept is not only about memorization of actions or data, learning is a deeper process, incorporating and interrelating what is known and has been learned to increase personal growth and satisfaction with self.

We as trainers shall focus to influence the senses through the intended perception of objectives, content and design. Objectives shall be clear and motivating for intelligence to abstract, compare and apply; content shall be accessible, recognizable and easy to understand; media design shall be oriented to the learner’s preferences.

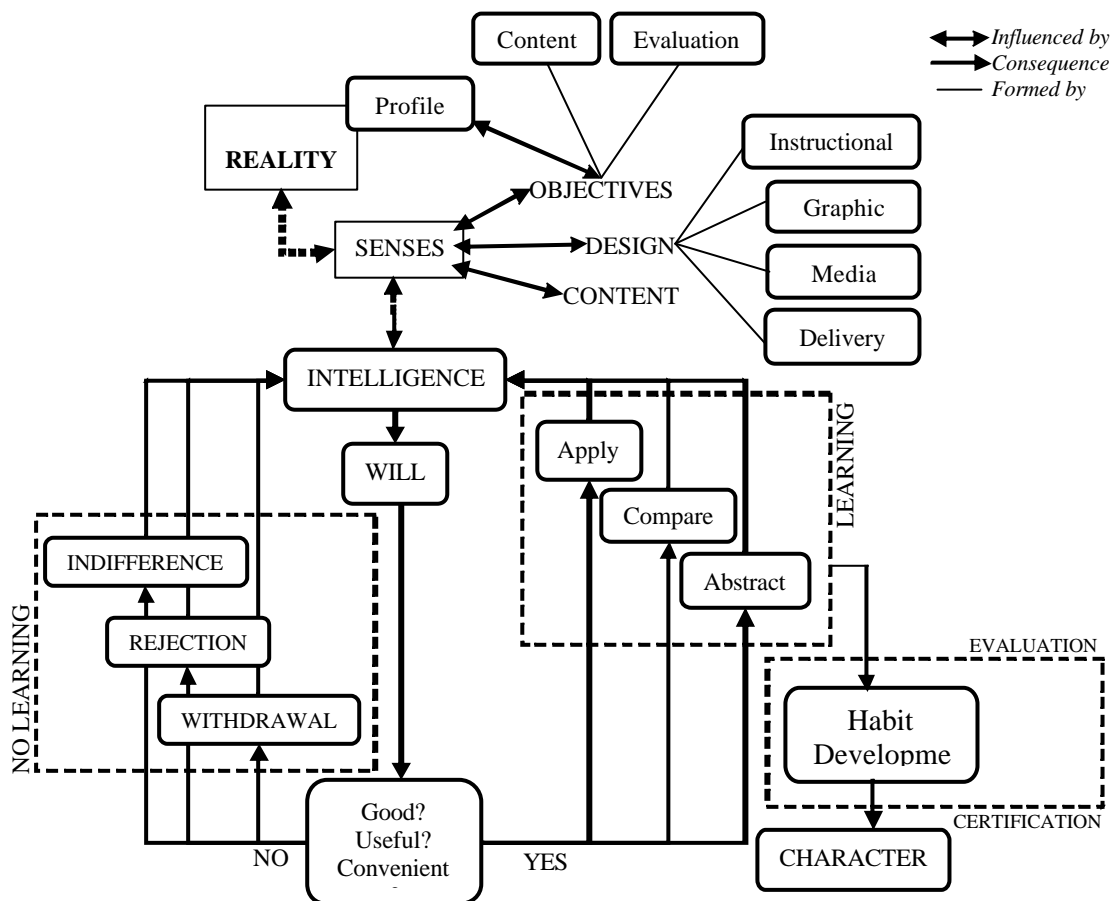


Figure 1: The Model

Learners' profile

The profile we are interested is formed by the characteristics of the learner: culture, education, habits, preferences, familiarity with subject matter, exposure and predisposition towards content or computers, availability and access to distance education media, etc.

Objectives

One expression of the learning process is the modification of the learner's conduct. The determination of the expected behaviour clarifies and defines the path to follow. The fundamental question is: *What should the person know, do, identify, etc. at the end of the course to be considered trained?* In other words, *what are the intended behaviours and habits that the person should have?*

From these needs the educational objectives are derived, based on previous experience and knowledge, and expressed in terms of required knowledge or abilities. Therefore, for each objective the expected outcomes or performances should be determined, from which content and evaluation are easier to design and follow.

Content

Content is determined by training objectives, and shall be structured by traditional didactical principles (Alves, 1963): simple to complex, easy to difficult, concrete to abstract.

Design: instructional

Based on the learner's profile, the design of learning objects must accomplish the following:

- Learners must be shown information in a significant way
- They must have the opportunity to manipulate the information
- They must have the opportunity to acquire more information
- Information shall be easy to apply to the learner's environment
- Feedback capabilities shall be designed into the management of learning objects

Design: graphics and media

Text-based materials are not easy to master for people with low educational levels, and as Smith and Fisher (2000) affirm "The cultural act of reading has become increasingly less important, or even irrelevant, since new technology has made reading less necessary to the general attainment of knowledge". Especially in our country's workers, reading comprehension is neither practised nor preferred (See OREALC, 1993). A picture, either static or preferably in motion, is easier to repeat, understand and follow.

Slow motion, learner-controlled pace and the capability for endless repetition form the backbone of our graphics-based interface. Colour is used to get and maintain attention, with video clips to illustrate examples or applications of content, but preferably not to explain, as more controllable animations get better results. It is imperative that the objects depicted in animations and video clips resemble closely the actual objects the learner will work with, even actual photographs and video of the real premises, looking for remembrance of known shapes and interactions rather than the application of abstract structures to real situations (the realm of architects and engineers).

Delivery

The process shall be constrained by the learner's willingness to use computers. In this context, connectivity, age and successful exposure to computers are relevant variables to consider in the decision of which media to use. As the keyboard, screen and speakers are the sole interface between the learner and content, available connectivity to the learner's computer dictates the possibility of using video or large pictures that require the transmission of large files. Current mass availability of

bandwidth in our country dictate the preference for compact discs, leaving online transmission for control or dynamic information used by supporting software, not directly by the learner. Embedded programs in the animation files communicate with a server through the Internet to get individualized data for each course and learner. These programs send exams along with the grading program, so that learners get their results right after finishing each exam, along with the right answer to every question done wrong, helping the learning process.

Consequences: examples of the application of the model

From three successful implementations we have developed:

Learners' profile

After interviewing company executives and visiting facilities, it was determined that most employees had 6 to 12 years of formal education; a low preference for reading, had not developed good reading comprehension abilities; were visually oriented or comprehended visual content with ease; and had a low attention span. They were spread out all across the country, available infrastructure restricted reliable bandwidth to that of an old phone line, no more than 33kbps (thousands of bits per second).

Learning objectives

The learning objectives were determined in accordance with our model, in terms of expected behaviour:

- Salespersons shall know the technical characteristics of products, in order to give customers the right information and be able to suggest configurations adapted to the customers' needs.
- Service personnel shall know the service manual procedures and specifications, in order to perform repair procedures according to standards, and assure customer retention.
- Operators shall be able to assemble / disassemble specific engines, with the proper adjustments and procedures, with emphasis in safety and quality.

Content

Content was defined by the company:

- The technical characteristics of the products, configuration procedures and standards.
- Service manuals and standards.
- Engine parts, diagrams, measurement, assembly and adjustment specifications and procedures, safety guidelines, operation manuals.
- Feedback and discussion forums were established to aid in communication among learners, the "Fourth Level of Interactivity" where participants clarify understandings (Weatherly and Ellis, 2000).
- Academic control was established using an evaluation database and support system in an Internet server.

Media and delivery

- Learner's profile and his/her access to computers linked to Internet were assessed, finding that learner's have access to a computer at least at work, and are willing to use it. Content is technical, related to measurable performance

A distance education model is therefore applicable. Preliminary evaluation can be conducted online. However, as there is no current technology to supervise an actual procedure over distance, final field verifications are specified.

Given the geographical dispersion and available connectivity, CD-based delivery was chosen, with Internet academic control and evaluation database. Learners are able to study without a connection, as only evaluations require Internet access.



We are facilitating the learner's process of imitating the course's content with actual workplace practice; so all images and video were taken from real workplace conditions, or supplied by the company. Every time an image of a tool, machine or part is shown, it is a realistic representation of the objects the person will have in the workplace. Visual identification is sought after in every image and video clip.

Results

We developed training programs for three large groups of employees, following the model explained. Informal, unstructured interviews with learners and company executives (formal reviews are not permitted because of company policy) show that:

- Trained employees were able to perform new duties without any other courses.
- The possibility of taking different paths within the course at will, visual identification of course images in the workplace and learner-controlled repetition were repeatedly mentioned as significant aids in understanding interrelationships, causes and consequences.
- Courses were also used for reference; workers returned to the courses to check procedures or adjustments while doing their work.
- Performance of workers trained with our courses was similar to traditional methods, with significantly lower costs (cost per worker was 36 times lower) and in a shorter time frame (6 months vs. 2 years). No errors in actual procedures were detected that could be caused by our courses. Supervisors told us that workers showed a better understanding of why things worked, not only how to make them work.
- Based on the first successful courses, a simulator-based course for production line operators was approved and is scheduled for on-the-job training beginning in January 2004. Operators will use it to learn and assemble automobile components, with no previous training in assembly procedures.
- 3,800 people in one company, and 200 dealers in another, have used the courses.

Problems we faced include adaptations of: the initial graphics design, communications software due to local reliability of connections, and evaluations, due to regional differences in nomenclature.

Implementation was done with intensive feedback from company executives, and a prototype run on a real facility. Feedback resulted in changes in images and examples, graphics-based evaluations and the addition of a section to test product configurations.

We have learned to adapt the software to the course requirements, searching for the right programs for the problem at hand, instead of choosing a specific software piece and then restricting the course to its capabilities. One consequence is that we decided to design and implement an online evaluation control system, instead of relying on commercial learning management software (LMS), other is that we decided to use a combination of two- and three-dimensional animation, internet database and communication software, after the unsuccessful initial trials with only one software.

Conclusions

Given the proper learning model and environment, training can be done at the workplace, during normal work activities, becoming at the same time training and reference. This merging of the learning and working realities facilitates comprehension and the application of new knowledge, increasing the success (and thus motivation) of the employee in getting reliable results from his/her work, and lowering training and operating costs for the employer.

Work continues on the improvement of distance evaluation methods and on the design of animations better suited to help learners comprehend procedures and sequences. Sound is an option we have yet to use, and increasingly available Internet access may change the media design and delivery preferred today.

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Authors

Mario Doria and Rafael Santana
Tecnológico de Monterrey, Toluca Campus
Centre for International Competitiveness
Eduardo Monroy 2000, 50110 Toluca, México
mdoria@itesm.mx and jrsz@itesm.mx

AN ACCESS TO LEARNING OPPORTUNITIES FOR ENTREPRENEURS USING NET-BASED LEARNING TOOLS

Rigmor Sterner, Luleå University of Technology

Background

Since 2002 the Leonardo project, REDILEM, is aiming at promotion of regional social-economical development in regions with high rate of unemployment and with limited access to learning opportunities. The aim of the project is thus to create a new type of education for SME managers through a combination of various partners in the project, such as universities, local private training organisations and SME associations, which will link the theoretical interdisciplinary education and practical training within a learning network. This will be achieved by supporting the managers of new SMEs through a creation of a distance-learning programme using an already existing LMS (learning management system).

The partners involved come from Slovakia, France, Germany, and Sweden. The main tasks for Luleå University of Technology are to produce and implement methodological models for learning support, where the study-guide is the base. We will also create a model for a net-based teacher-training course. The project will use an LMS called Claroline as the "classroom". Self-studies will be done with the study-guide and the course material in the LMS. Communication and activities during the course time between student and teacher and groups of students will be kept asynchronous in the LMS. We will also produce a model for teacher training.

Net-based learning with the study guide based on the course literature is together with different technical tools – even for the same course – the fundamental ingredients in the learning environment, which the distant student meet, when starting a distant course. Often even the campus students today are working via e-learning and a study guide together with campus sessions.

Study materials and learner support

If I as a teacher had all the technical equipment in the world, but lack knowledge about, or even information about, how I could give my students the best form of support during their learning period, the education time would not become a success, neither for them nor myself nor the education provider.

Several factors are cooperating in a net-based learning environment. Most of them could very well support the teaching. The planning before and during the course is basics, and takes often more time than the ordinary lesson planning. On the one side there is an overall planning, where factors have to be considered about the target group, capacity, ability, access of technique and knowledge, experiences, motivation, geographical spread, special needs, module goals, skill goals and knowledge goals, etc. On the other side the teacher has to consider every part of his/her lesson and how these parts will be realised towards the goals.

According to John A. Bååth,¹ we need to understand the situation of the distant student, and how we in the best way could organise the education and support, so (s)he does not quit the course before end of course.

In all DE, regardless which technical tools we use, and if teachers and students meet in real time via videoconference or communicate in another way, some special study material has to be produced. The

¹ Bååth, John A., "Handbok för distansutbildare", 1996

course literature thus needs a guiding material, where reasoning is going on, which Bååth² calls “simulated two way communication”. There you find instructions, explanation, and questions. There you are urged to reflect, and you find comments and all information about how to do with tasks and assessments. There you find all that we leave to the student in the classroom. Here is the kernel of DE pedagogy. This study guide could be produced only in written, and delivered via the LMS. With the technical tools there are nothing that hinders a combination of written, audio and picture, or in other ways we could think of for meeting different learning styles. The realisation depends on time, money and production possibilities.

The teacher

There is a lot of talking about the new role of the teacher in the “e-classroom”. The difference might be in the teaching environment and the methodology. That is obvious for the teachers who long ago learnt to handle the DE situation. This teacher had learnt what was needed in order to support the students, learnt how to maintain a high motivation among the students, learnt to create a good atmosphere at a distance, learnt to use the technical tools as just tools for communication, lessons, discussions and delivery of information and material. This teacher probably does not have any problems in asking the right learning supportive questions or in giving the supportive feedback.

The teacher also needs support from somewhere. There are lots of didactic speculations the teacher might have. There is often very little time for one teacher working in the same time in the campus classroom to deal with distance courses. Distribution of continuous information and material is often laid on the distant teaching teacher. Production of study material, study guides and technical backup are also a part of the teacher to deal with. So how could the teacher support the student?

The student

An e-learning student might find him-/herself in an unusual learning environment. (S)he has many questions before and during the course, both of an administrative and of learning character. In what way could (s)he have the best answer to the questions? There should of course never arise any doubts about what (s)he should do, when, and why. Evaluations and experience report that information before and during the course is A and O. It should be correct information well in advance. Directed to the right person – which means with a content describing the circumstances in details.

Results have shown, that students in e-learning courses often have high ICT competence. They use the computer regularly. They have experiences from ICT in teaching and learning in different ways. Some students also say, that their pre-knowledge is sufficient in relation to the technique that is used. Probably we have and will have a “computerised” generation, the so called “Homo Zappiens”, at our net-based courses with high technical knowledge and awareness. But we will also meet a generation who is taking their second chance in life to educate themselves, and do not have the same readiness for using the computer as learning means.

The education provider and the teacher have to be aware of that the learning situations and learning styles of the students differ. The communication and the dialogue seem to be out of question according to the students. They need the supportive “voice” of the teacher. They need to be met by a person, with whom they can discuss problems – even private problems connected to the studies. They need a well-prepared guide throughout the course. They need contact people besides the teacher. They need personal guidance, when particular difficult parts in the course literature occur. They need to work at their own pace, and they need encouragement.

From responses we have had from some SME managers, we have learnt that they are helped if they easily could find education somewhere, a choice of packages of courses, not too long, not too complex, but well designed, well supported by technical tools easy to use, and an immediate feedback

² Bååth, John A., “Handbok för distansutbildare”, 1996.

from a teacher or expert. We have also found that the technique must not be too complex or demand too much of the user. We also know of SME managers who do not use the computer and Internet every day. They say they have too little time for the technique, as they are the only person in the firm. They also say that they wish more knowledge in their specific field, not only about computers, but have very little time for personal development.

The administration

The question of administration of the courses in this project is besides the tasks of Luleå University of Technology, why I leave that discussion. However, the student needs to be supported by the administration, the course provider, and needs to have a contact person to reach, when and if problems would occur, etc. The students will however have the necessary information about the courses and their contents at the LMS.

The material

Students appreciate a thoroughly planned course design and the study-guide. They think that there should be a lot of meaningful reflections pointing at the course literature and their experience. They wish clear information about the course curriculum and course literature, content, tasks/assessments/hand in, contact people, time plan, study hints, demands, and activities. They also wish comments to the reflections. How this could be delivered in the best way depends of course on which LMS the education provider has decided. The student should easily find all that is needed however.

Teaching and guiding has as usual to be planned in advance. To instruct and explain together with asking questions are the same as in face-to-face sessions, although in written – mostly. In the same time we need to introduce and inform about all the activities, which have to be carried out at a distance, as well as discussions with other fellow students and teachers and the distance didactic dialogue.

Literature and course material are thus the textbooks and other study material, where the produced study guide as the teaching teacher is included. For the project special text material has been developed. This is produced in the languages of the project partners, a full text and also a short version in English for the student to read and find links to the full texts.

The support in REDILEM

For REDILEM the project partners have decided to use a programme called Claroline. There the student will find course information and the text-material. Within each module of the education, the student will also find the tasks and reflections. The students will be able to work from a base text onto the full text. They will be able to interconnect with articles at Internet. This is seen as an advantage for the students, as they easily can select the material they find the most interesting and useful.

As the project is in progress there has not been quite finalised the types of questions for discussion, reflection, tasks and other interactive exercises. This is for the teachers and project partners to work out. The basic text document will be the guide for the students with explanations and information etc.

The LMS, Claroline, has possibilities for group work and discussions, forum for questions and answers, possibilities for document handling, hyperlinks to Internet, search motors, etc. It is a system used for creation and performance of electronic courses. It enables e-courses via web browser with connection to Internet. This type of virtual university is a place, where the students meet when studying their courses. “They obtain information about a specific course; they study multi-medial materials of a course; they can communicate together; they can solve problems, and test their newly obtained knowledge”, as is said in the manual. It is not my aim in this paper to describe the selection of functionalities of the Claroline system. I will just mention what the student will find when starting a course after having registered, had a log in and a password. The courses include

- information about the course, agenda, announcements, contacts with other users of the course (teachers and students)
- content-items such as documents of different types and hyperlinks to websites at Internet
- discussion forum for the separate case studies
- tests and exercises.

The study materials of a REDILEM course are processed in a hypertext form.

Each course is divided into five modules and chapters. The students gradually pass separate chapters where they find aims, glossary, explanatory parts, case study, summarisation, tests, assignments and exercises, questions for discussion, and further study literature. The student will obtain new knowledge via the materials, and this knowledge will be verified by solving case studies. The student could upload his/her solution into the system via student papers. Each case study is provided with questions for discussion. The student can discuss possible solutions with other students via discussion forum.

The student will meet a questionnaire to fill in before the start of the course. This will help the student and teacher to make clear if there is any problem for starting the studies. There is also a place for the students to put in their own documents for comments. As for exercises there is also a self-testing possibility. The teacher is nearby for answering questions, and the students have possibilities to meet asynchronously and discuss. The students will also be supported by information about the course, and there is a place for the agenda, and what is going on.

The study material, the texts and the study guide, is there to provide the student with knowledge information, tasks, reflections and comments, discussion questions and other learning support, which is needed. The teaching materials for the courses, five textbooks, have been developed in print in Slovak and English languages, such as ‘Integrated management’, ‘Fundamentals of Entrepreneurship’, ‘Enterprise Management’, ‘Modern Technology and Environment’, ‘Communication and labour psychology’, ‘Information systems - computer and information technologies’. The project partner of Slovakia made this. There is one bilingual textbook in Slovak – French (La qualité et l’innovation - Kvalita a inovácia). The text materials have been tested within the pilot course of SME managers organised by Slovak Craft Industry and Small Business Federation.

As project partner Luleå University of Technology is to create and has delivered a model for study guides. We are supporting the course teachers to develop the study guides. We are to support the teaching staff in course design, particularly on methodology and pedagogy, e.g. on distance communication, dialogue, tasks, and other learning support. We are to support the distance-teaching teachers in developing their study guides based on the course literature, and we have prepared a teacher training course in English. If possible we would carry out the teacher-training course during 1½ month using Claroline for the asynchronous communication and another tool, MarratechPro, for face-to-face meetings and discussions. This choice could be an advantage because of little time for the teachers, and there could be a good support for the teacher to develop his/her own course guide.

As most of the teachers in the project have used Claroline, they are more or less familiar with the technical tool. We know that they are not so familiar to using study-guides as the teaching tool. From many years of experience we know that knowledge about planning for and production of study-guides give the teachers a base for their own net-based learning and teaching. Many distant teacher-training courses have been carried out through the years, where the teachers say they have had good help with developing their own teaching. They say that the courses have given them preparedness for working out their own study-guides, and how they in the best way could support their students in their studies. The feedbacks they have had from their students also support their belief in a good and well-prepared study-guide as a learning support.

Conclusions

We know from previous research and studies that the guidance and the study-guide are the main tools for distance learning and teaching. The technique is the bridging means we need for the interactivity and communication, as well as material delivery. With the work with the guides and other study material together with the teacher-training course, we hope to give the teachers a base for their own development of net-based learning and teaching when using a chosen technical tool for their own subject and course. From the models of study-guides, evaluations, tasks, etc., which we provide, we hope the teachers will be able to work out their own study-guides and study materials.

Where Claroline has been used in Slovakia, the students and the teachers have met a useful tool for their courses. They have had good support for their studies easy at hand. Therefore we see that there could develop a good support for the managers of SMEs to get hold of new knowledge at a study time and pace they themselves decide for, as they will find a particular course, a full course or just a part of a course they need, and “ready made” from the LMS. This might be of help as there are produced packages of study materials to choose from, which we hope will support their learning, as they make their choices out of need, interest and motivation. They pick up their studies, and will get support from the material and the teachers. They get hold of knowledge in an easy way, when they need it, and when they have time to.

For further information

<http://redilem.sjf.stuba.sk/start.htm>

<http://os.euba.sk/~learn/>

Author:

Rigmor Sterner (Project Manager)

Luleå University of Technology

Guldv. 22

S-92137 Lycksele

Sweden

rigmor.sterner@telia.com

DESIGN AND USABILITY METHODOLOGY IN E-LEARNING A CASE STUDY

Maria Laura Bargellini, Gemma Casadei & Loredana Puccia,
Italian National Agency for New Technologies, Energy and the Environment

Abstract

The present paper describes the R&D effort carried on at ENEA (Italian National Agency for New Technology, Energy and Environment) on Methodology and Technology design of e-learning modules based on the learning centred approach, user requirements and usability. The results of our research have also been utilised in two ESTO¹ projects [1].

Introduction

The rapid evolution of information & communication technology and science requires continuous professional updating since nowadays teaching – to date confined merely to school and university -is should be considered a part of continuous lifelong learning process. Furthermore technological innovation has contributed to the development of better teaching support tools, thereby allowing for a flexible and customized learning plan, which provides people with equal opportunities for access to and success both at school and at work. In fact advanced Information Communication Technology (ICT) tools in the new learning scenario means that learners, otherwise unreachable, or learners in socially, physically disadvantaged situations can benefit: 860 million adults are illiterate, over 100 million children have no access to school [2]. The new Knowledge Society, one of the European Union's objectives, offers important opportunities and challenges for ICT applications especially in the education and learning domain, which plays a primary role.

In the didactic framework ICT revolution emphasises the learning - centred approach versus the teaching-centred model. The ICTs use promotes the switch from passive learning methodology (to watch and to listen) to the active learning methodology. The latter means: learning through all senses (sight, hearing, touch, smell and taste); learning through all methods (at school at university, online); accessing knowledge without space and time constraints (anytime, anywhere) thus learning during the entire life span (lifelong learning).

This can be considered as a Copernican revolution in domains of education and training.

While the didactic heart of the teaching centred model is based on teachers and their knowledge, in the learning centred model learners play an active role by building, according to a customized learning action plan, the knowledge and training path best fitting their own pace and style.

Methodological approach

On 21 November 2001, the Commission adopted a Communication on *Making a European Area of Lifelong Learning a Reality* [3], where the education & learning area is divided into three forms:

- Formal learning is the learning *typically provided by an education or training institution, structured (in terms of learning objectives, learning time or learning support) and leading to certification. Formal learning is intentional from the learner's perspective.*

¹ European Observatory of Science and Technology (ESTO), founded in 1997, is a network of organisations operating under the European Commission's – Joint Research Centre's (JRC's) Institute for Prospective Technological Studies (IPTS) - leadership and funding. The mission of the ESTO network is to broaden and develop the knowledge base of the JRC-IPTS on prospective science & technology (S&T) developments to supply EU decision-makers with processed, original and timely S&T information of potential policy relevance. (<http://esto.jrc.es/>)

- Non-formal learning is *the learning that is not provided by an education or training institution and typically does not lead to certification. It is, however, structured (in terms of learning objectives, learning time or learning support). Non-formal learning is intentional from the learner's perspective.*
- Informal learning is *learning resulting from daily life activities related to work, family or leisure. It is not structured (in terms of learning objectives, learning time or learning support) and typically does not lead to certification. Informal learning may be intentional but in most cases it is non-intentional (or "incidental"/ random).*

In the future scenario Lifelong Learning should increasingly take place throughout life in these forms, none of which ought to be exclusive. Learning, therefore, should be based upon four pillars [4]: learning to know and learning how to learn; learning to do; learning to live together; learning to be.

Educational/learning process becomes ever more flexible, independent, and permanent. Currently, all educational/learning phases should be integrated and projected into a ubiquitous learning environment, based on a horizontal approach in terms of methodologies, technologies, tools and services.

From the technological point of view the future learning scenario will take advantage of emergent ICTs and at the same time will direct technological research efforts. In fact the educational /learning field already represents a large market share.

An analysis of the future impact of the development of ICTs demonstrates the following factors will be influential and thus need to be taken into account:

- the use of Intelligent Agents in the learning and evaluation knowledge process;
- seamless, adaptive and interactive User Interfaces;
- intelligent retrieval tools;
- active network at local, national and global level;
- mobile technology;
- growth in computer capacity/speed, shrinkage in computer size;
- display device evolution;
- low-cost communication and computer technology.

From the methodological point of view, our R&D' are aimed at defining:

- new actors and roles in different learning phases (instructional designer, didactic expert, content expert, psychology expert, andragogy expert [5], mentor, facilitator [6,7], ICT expert, etc.);
- architecture concepts (virtual class, virtual laboratory, synchronous/asynchronous interface, multimedia/multimodal interfaces evaluation test-beds, e-mail, bulletin board system, etc.);
- design phases and standards;
- evaluation of performance through the usability test.

In particular, the present paper focuses on the last two aspects.

Design phases and standards

We articulate the design of an e-learning course in the following seven phases:

- User requirements: social and cultural context analysis, identification of users specific needs (through surveys collection and analysis).
- Conceptual Design: the choice of methodological tools, conceptual schema development, analysis of HW/SW platforms regarding their performance, and resource and time planning.
- Implementation: HW/SW platform choice, experts' selection, Learning Objects² and Evaluation Modules implementation.

² **Learning object:** A reusable, media-independent collection of information used as a modular building block for e-learning content.

- Verification: checking for consistency and completeness.
- Validation: evaluation, based on measurement and human judgement, of the e-learning course with respect to its usability.
- Spreading: course activation through direct access on the network..
- Maintenance: taking into account the results of usability tests, system verification process and learning user self-evaluation tests, the maintenance phase provides new input for e-learning course improvement.

In our developing design [8] we defined an e-learning course as a didactic path directly accessible through the network, with a precise cognitive goal, where the user's requirements are well identified, as well as learning results and learning evaluations. An e-learning course is split into three levels:

- The *Unit*, identified as the elementary learning particle linkable to other units and reusable.
- The *Lecture*, defined as the knowledge atom characterized by an informative/formative objective and composed of several units.
- The *Module*, identified as lessons organic compound, it can exist stand-alone and can be reusable. The module has well defined content and learning objectives, and the learning level reached can should be evaluated. Moreover the units can be reused in more lessons in different modules (fig.1).

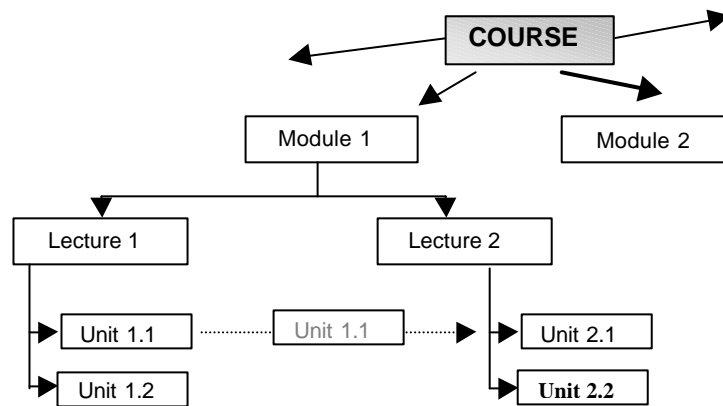


Figure 1: e-learning course structure

The didactic resources available online are the largest existing educational archive where resources are diversified according to structure, format and contents. In order to manage effectively the learning resources in the ICT field a set of specific standards for learning is required to ease interoperability, reusability and resource sharing/updating and to avoid data redundancy [9].

The use of standards, in the new learning based didactic scenario, allows learners to customize their training path in line with their skills and needs.

Following the promotion by the U.S. Department of Defence (DoD) of the Advanced Distributed Learning (ADL) Initiative, several standardisation institutions are co-operating toward the definition of a set of e-learning standards. This collaborative effort produced the Sharable Content Object Reference Model (SCORM).

At the moment SCORM is the most reliable and well-known standard model and is based on the Learning Object (LO) and Learning Object Metadata (LOM) idea. Several definitions of LO [10] are given in the various technical literature; the SCORM refers to the IEEE standards that defines [11]:

- Learning Object as any entity, digital or non-digital, which can be used, re-used or referenced during technology supported learning;
- Learning Object Metadata as the attributes required to fully/adequately describe a Learning Object.

The standard model, in short, suggests to label a LO through a file, written in XML language. This file, named LOM, contains information necessary to mark the LO and to make it directly usable online. Nowadays the SCORM model doesn't taken into consideration some open issues [12, 13]and raises a number of questions at different levels:

- technical: a single repository accessible on the web appears prohibitive due to the high operating and managerial costs;
- educational: the granularity, the ordering, the pedagogical worth and the learning goals of the didactic resources are subjective and dynamic. The didactic resources must be flexible enough to adapt to various educational environments; whereas the use of labels is objective and static;
- pedagogic: essentially, the learning path is determined more by objective factors, such as marking, rather than the more subjective factor of a student's style of learning; moreover the ontology (that is the a priori definition of concepts connection) in Didactic field is in contrast with Constructivist Didactic Methodology;
- socio-cultural: to store, catalogue and index all didactic resources on the internet means to adopt prevalent cultures, to lose the richness of other cultures, and to risk not giving right space to those cultures that are technologically and economically less advanced than others, even though these cultures should be treated equally and, therefore, safeguarded. Indeed, the definition and the adoption of universal standards presupposes economic resources and advanced technological skills, also in relation to the drastic increase in the competitiveness of the market. Standards, therefore, can't be unique for all the didactic resources, but they must be open to allow for the connection and integration amongst all didactic resources, from whatever culture.

By definition, a learning resource cannot be reduced to an automatic format, like a digital object, but it requires a more articulate method of classification and communication.

Many projects, at European level, are being developed to solve these problems, i.e. to find better standards supporting various aspects of the learning process, e.g. using web semantic approach.

Usability evaluation

Several definitions have been given on Usability and on its attributes and several studies have been aimed at defining metrics to measure usability:

- The ISO 9126 "Information Technology- Software Product Evaluation- Quality Characteristics and Guidelines for the Use" defines usability as "A set of attributes that bear on the effort needed for use, and on the individual assessment of such use, by a stated or implied set of users";
- The ISO 9241-11 'Ergonomic requirements for office work with visual display terminals- Guidance on usability' defines usability as "The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use";
- Jakob Nielsen underlines that "the usability is not a single, on-dimensional property of a user interface. Usability has multiple components and is traditionally associated with these five usability attributes: *learnability*[...], *efficiency*[...], *memorability*[...], *errors*[...], *satisfaction* [...]" [14].
- Albert Badre proposes four kinds of usability measures: *time to learn*, *time to perform a task*, *number and type of errors*, *length of time a person will retain the information* [15].

In the ENEA the R&S' on usability started at the beginning of the nineties during the realization of the VENUS³ (Visual ENquire USer interface Esprit III #1398) project funded by the European Union.

³ The VENUS is based on a visual, icon interface, to enable the user to identify, select and retrieve information and data from multimedia, heterogeneous and distributed databases.

In this context an experimentation and validation methodology was building to test the usability of the user-oriented interface; a pilot site was putting in place to perform the usability test. A metric and procedures were defined in order to measure usability parameters [16].

At the moment our R&S' are focused towards adapting attributes, procedures and metrics, that are defined and used in the interfaces usability, for e-learning field.

User groups are organized and metric cards are proposed to measure the following attributes:

- Learnability: The e-course should facilitate learning, the didactic units should be simple and the learning goal should be clearly defined.
- Efficiency: The e-course should amplify the learner level of knowledge.
- Memorability: The cognitive path should be easy to remember, the learner should be able to find easily the subjects or concepts learned when returning to the lessons after some period.
- Satisfaction: It should be pleasant to learn using the e-course.
- Errors: the error rate should be low.

A case-study: The Course FOTOVinst

Also in Europe there is much interest about Distance Learning: Since 1998 EU financed a Project in order to implement a multi-lingual dictionary dedicated to e-learning. In this dictionary the Distance Learning is defined as *Individualised study in which the learners work entirely away from an educational campus. Contacts with tutors are usually by telephone or mail (including email)* [17].

For this reason, the Distance Learning is an important educational tool to look at for human resource development and exploitation in accordance with Lisbon Council guidelines and EU assertions on the creation of a Knowledge-based Society [18].

ENEA started in 1995 a R&D activity on the application of new technologies to Distance Learning. In 1996 a project was started to the purpose of setting up a website "Integra Module" [19] entirely devoted to Distance Learning and diffusion of ENEA experts' know-how. At the time of writing, this site hosts 30 courses, visited by 12.000 users, and represents a useful test-bed for usability validation and customer satisfaction assessment.

The courses, available on the website free of charge, aim to professional training/retraining of workers already employed and of anybody wishing to amplify their knowledge. The web-site has been designed with a friendly interface, so that do not require a specific skill in computer science.

Every course is described by a minimum data set, which represent the ENEA standard.

The reference standard adopted consists of an introductory card describing the goal the intended audience, the pre-requisites, the content, the estimated time for completion and other useful information (references, contacts, etc). The card is accompanied by a video-clip.

"FOTOVinst" is an example of e-learning course based upon the above mentioned methodological approach. This is devoted to the professional re-training of photovoltaic plants installers.

The basic motivation for this choice stems from the fact that research on renewable energy sources and the technological transfer are among the ENEA's main activities and duties.

FOTOVinst is addressed to photovoltaic plant installers in the framework of national program "Italian rooftops"[20/ promoted by the Italian Ministry of Industry, Ministry of Environment, managed by ENEA and devoted to realisation of a photovoltaic system integrated in buildings (roofs, facades, shelters, etc.) and connected to the Italian electric grid. In the fig. 2 is shown the structure of the ENEA FOTOVinst course.

The structure of FOTOVinst is made up of four learning modules plus four additional modules devoted to: terminology, video-training, photo-training and reference documentation. A glossary is available in two ways: one independent and the other one online directly accessible. Moreover an

audio/video interview, describing the learning goal of the course and the curriculum required for learners, is available.

FOTOVinst is hosted on Integra Module web site and accessible free of charge since August 2003. Before being spread, the FOTOVinst course has undergone a test suite to evaluate its usability. In order to match all the possible end users, the questionnaire was submitted to a heterogeneous sample including:

- an expert of the topic covered by the course without a specific knowledge in computer science;
- an expert in computer science without a specific knowledge of the topic covered by the course;
- an expert of both the topic covered by the course and computer science;
- a person without any specific knowledge about the topics covered by the course or computer science;
- an expert on e-course design;
- an expert on psycho-pedagogy.

The practical implementation of the FOTOVinst course involved a heterogeneous task force including expert in many different topics from all ENEA Centers active on Photovoltaic research and e-learning.

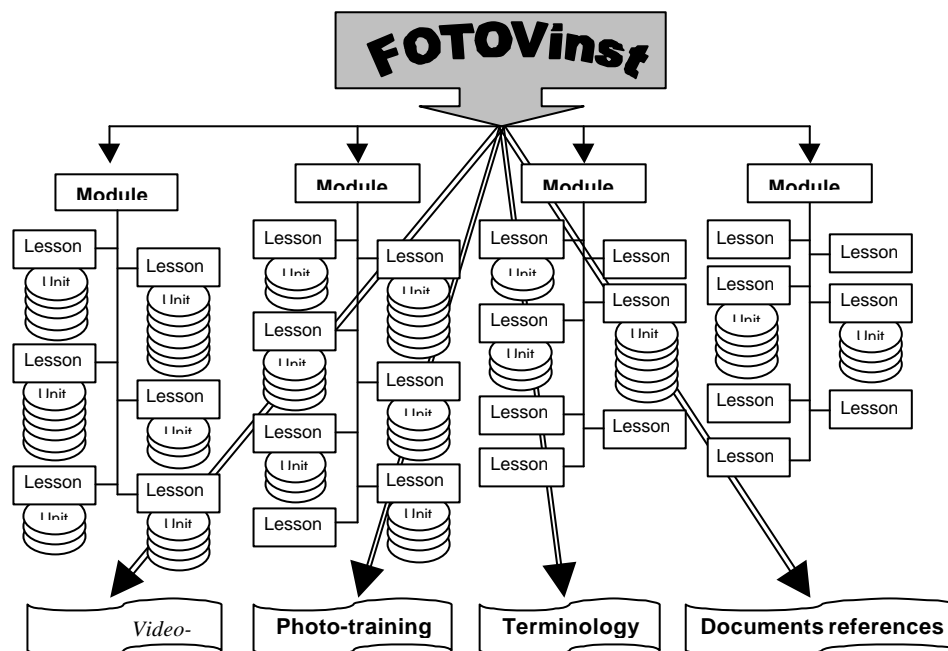


Figure 2: The structure of the ENEA FOTOVinst course

Conclusion

In the future Knowledge Society the knowledge will be direct accessed by the Cyberspace. In the educational/learning area the knowledge will be organised in Learning Objects (LO) that represent *a reusable media-independent chunk of information used as a modular building block for e-learning content* (see glossary), where for information we consider not only a document, but an expert, an experience, a contact, etc. In a future view we can envisage a *Knowledge space* full of LOs like web-seminars, lectures, digital libraries, digital museums etc. All LOs will be available online and organized using an open classification system through metadata.

In a future *Knowledge space*, a user should be able to give their desiderata (user profile); then the system should be able to suggest a personal learning path suitable to the user needs (profile), through the connection and integration of LOs.

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Authors:

Dr. Maria Laura Bargellini, Dr. Gemma Casadei
ENEA, UDA Advisor
C.R. Casaccia Via Anguillarese, 301
00060 ROMA (IT)
marialaura.bargellini@casaccia.enea.it,
gemma.casadei@casaccia.enea.it

Dr. Loredana Puccia
ENEA, UDA Advisor
CR Frascati via Enrico Fermi, 45
00044 FRASCATI (RM) ITALY
puccia@frascati.enea.it

PERSONALIZATION OF THE E-LEARNING SYSTEMS IN THE SERVICE OF THE LEARNER

Dejan Dinevski, University of Maribor

Introduction

The support of the technology in the learning process is becoming progressively sophisticated. This development has several positive effects, though on the other hand this same development seems to make the (some) learners feel uncomfortable. The variety of new technology features, services and functionalities may limit rather than stimulate the critical motivation in learners. Several articles for example [1] and [2] deal with the questions and the potential barriers that emerge when implementing e-learning in educational institutions. The barriers discovered in several case studies that are dealing with the learner's point of view are:

- Technical expertise, support and infrastructure (learner can be uncomfortable using new technology)
- Social interaction (technology can be an isolation factor for the learner)
- Student support services ("friendliness" of the institution depends on the friendliness of the technology)

The personalization of the technology platform offers the learning organizations a method for enhancing the learners' intimacy through their web site, which is, without any doubt, an additional motivation factor for the learner to whom the computer represents a major learning media. In the growing E-learning world which is strongly penetrating into the lifelong learning actions, personalization will be an important part of the technological support, also because we may expect big differences in the technological experience and knowledge of the learners. The technology providers will be forced to offer both highly sophisticated and at the same time "simple to use" e-learning functionalities. One of the major solutions to combine these two directions is the personalization of the e-learning technology platform.

In February 1999, the Gartner Group stated that, "matching direct or inferred reader requests through content personalization will be the most dramatic development in the Internet...through 2002, and will help differentiate the Web as a new medium." Clearly this is an important technology, and is being applied in many Internet systems in use today. Recent studies, for example [3] reports that relative advantage, compatibility, ease of use, and trialability significantly impacts the intended use of the personalization features on a web site. On the other hand visibility, image and result demonstrability were found not to have a significant impact on intent to use the personalization features on a web site. The study also found that the personalization features should be easy to use and should exhibit some advantage to the users to ensure adoption and use.

In the next chapters, the technology framework of the e-learning platforms is presented systematically in order to draw some recommendations and solutions for the e-learning personalization.

E-learning technology

"E-learning" can be seen as complete information technology support to learning processes. From the functional point of view there is a widespread acceptance that a "total" e-learning solution comprises the three key elements: Content, Technology and Services.

If one considers the now thousands of vendors that have entered into, this relatively new e-learning industry phenomenon, one will note that they invariably fall into one (or more) of the three categories - their core "product" will either be a content, technology or services e-learning offering.

Content adds to the knowledge, skills and capabilities of the human capital. Beside the "classic" classroom and published content the generic e-learning education and learning content (courses, events, resources, mentoring, etc.) is gaining the importance in the e-learning solutions. The trend of the learning content development is its interactivity, which forms a basis for the so-called "intelligent" learning modules. The intelligent representation of the content is trying to serve the learners with different background knowledge.

Technology comprises the:

- Infrastructure (Internet, Intranet or hybrid delivery platforms), facilities for offline and remote access, user interfaces and personalization and customization capabilities
- Learning content management systems (management of learning offerings - options for delivery, tracking, management and reporting of online content)
- Learning management systems (capabilities for skills dictionaries, competency definition and mapping, performance management, employee development plans, financial and activity tracking/reporting, integration with other systems)
- Learning technologies (mentoring, chat, forums, expert-led discussions, Web seminars, online meeting and virtual classroom sessions, etc.)

Services include:

- Consulting (Strategy and design of the e-learning programme)
- Support (assistance with implementation of the e-learning programme (launch, marketing and promotion, technology platforms and infrastructure, management feedback and reporting, technical and implementation support)
- Design and build services (build of custom content for the specific education, transfer existing materials to online format, tailoring and customization of the e-learning platform and delivery environment, and integration with other applications)

Requirements of an e-learning portal

The core of the information support for learning is an "integrated electronic learning environment". The definition of this term and the occurrence of other related terms are given in [4]. The popular terms denoting e-learning software are the "platform" or simply the "shell". Lately, though, the information support has been taking on a broader meaning, so the term "E-learning portal" seems to be the most appropriate.

The basic functions of an integrated electronic learning environment are [4]:

- Student administration, including
- enrolment/registration
- group mailing,
- management of student progress details,
- reporting of assessment result,
- class management, including
- establishment of classes,
- management of access to class resources,
- delivery of courseware,
- asynchronous conferencing,
- synchronous conferencing,

- exchange of documents,
- provision of access to support services,
- computer-marked testing.

This list contains very broad definition of the functions which can be practically realized in quite a different ways. Since we are dealing with their personalization here, we'll try to define the functionalities in more detailed way:

E-learning portal learner tools

- Communication tools
 - File exchange (submission of assignments and file upload),
 - e-mail (usually the external Internet e-mail address is necessary, but internal e-mail can also be provided),
 - discussion forums (with the possibility for different views – by title, author, date or thread),
 - real time chat (with the support for private rooms and administration from the side of instructors),
 - whiteboard.
- Productivity tools
 - Bookmarks (private comments and shared ones),
 - calendar (events posting and announcements, task assignments, etc.),
 - help (usually online guide and tools descriptions),
 - search (for headings, notes, literature, activities, discussion threads, etc.),
 - offline support (downloading the course content).
- Student involvement tools
 - Groupwork (possibility for the instructors to assign groups with the shared materials and dates),
 - self-assessment tools for students (with the possibility for instructor- created feedback and explanations),
 - student portfolios (usually just link to a personal homepage).

E-learning portal support tools

- Administration tools
 - Authentication (with the protection of the access for individual courses, IP restrictions, encrypted logins, authentication against external LDAP server or secondary source),
 - course authorization (with different access levels based on pre-defined roles like students, teaching assistants, instructors, administrators),
 - registration integration (with the possibility for the instructor to add students to the system).
- Course delivery tools
 - Automated testing and scoring (creation of true/false, multiple choice, multiple answer, ordering, fill-in-the-blank, matching, and short answer/essay questions),
 - course management (with the selectivity for releasing materials based on specific start and end dates),
 - instructor helpdesk (accessing the manual, the product knowledge base and the reference center, also the technical support),
 - online grading tools (with view possibilities by assignment and by student),
 - student tracking (reporting about the connection to the system, the number of times the student accessed course content and discussion forum),

- Curriculum design
 - Accessibility compliance (with the standards),
 - course templates (support for template-based course creation for syllabus, course descriptions, course units, announcements, resources, biography, links and vocabulary),
 - customization (personalized color schemes, course logos, headers, footers, etc.)

Personalization technology

Three aspects of a Web site affect its utility in providing the intended service to its users. These are the content provided on the Web site, the layout of the individual pages, and the structure of the entire Web site itself [5]. The relevance of each of the objects comprising a Web page to the users' needs will clearly affect their level of satisfaction. The structure of the Web site, defined by the existence of links between the various pages, restricts the navigation performed by the user to predefined paths and therefore defines the ability of a user to access relevant pages with relative ease. However, the definition of relevance is subjective. It is here that there is a potential mismatch between the perception of what the user needs, on the part of the Web site designer, and the true needs of users. This may have a major impact on the effectiveness of a Web site.

Personalization technology involves software that learns patterns, habits, and preferences. Personalization is a toolbox of technologies and application features used in the design of an end-user experience. Features classified as "Personalization" are wide-ranging, from simple display of the end-user's name on a Web page, to complex catalog navigation and product customization based on deep models of users' needs and behaviors. Similarly, personalization technologies range from commonplace use of databases, cookies, and dynamic page generation, to esoteric pattern matching and machine-learning algorithms, rule-based inferencing, and data mining [6].

As far as the technological process is concerned, personalization can be considered a three-step process in which customer information (their preferences, behavior, and profile) is taken as input, business rules are evaluated, and customized content is generated as output [7].

Personalization in the e-learning systems

When developing a complete e-learning technology solution (model, software and portal), presented in [8] we proposed and implemented some personalization features that are especially appropriate for e-learning systems. In details the personalization itself is presented in [9].

The users of the e-learning portal can be more productive if the portal is following their needs and interests. There are several common "personalization" solutions. For instance, for the purpose of the role division, one is provided, after authentication, with specific content and outlook. This "personalization" is driven by fix role categories of the users (teacher, learner, administrator etc.). Basically, this is not a part of personalization but authentication, or better, security service. However, it raises a notion about user segmentation in general and personalization provision for them. Authentication is important but not required for identification of users. Personalization is performed according to some kind of profiles, whether aggregated or individual. We also have to distinguish between registered users and anonymous users and treat the latter as potential customers with triggering some special "program" to retain them (Fig. 1). They should be offered by relevant content (and possibly presentation) as soon as possible. We have to take into account that the personalization ideal is constrained also by a today's hardware and a need to provide personalization in real-time. The goal should be to achieve personalization without or with little user intervention as possible with tracking their usage data.

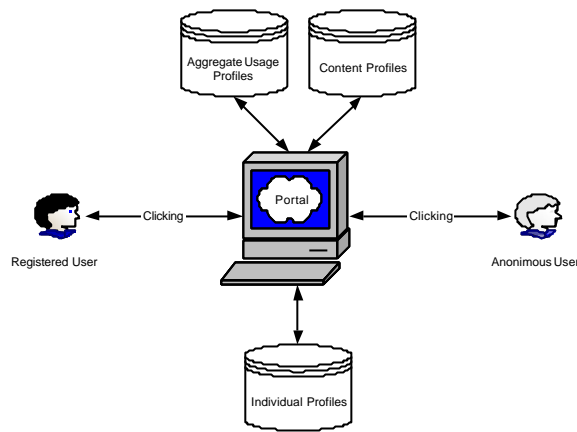


Figure 1: Tracking anonymous users [9]

We assume the best approach for the first time visitors is offering personalization after some clicks. As presented in [10], this is solvable by comparing the current user session to aggregated usage profiles. The comparison is performed in real-time by an online component. The aggregation, though, is achieved by offline component. Aggregated usage profiles are obtained by clustering episodes of web access log data.

- Important personalization phases
- Data preparation is the essential personalization phase, which enables subsequent knowledge discovery and pattern analysis phases, respectively. Confidence of interesting patterns, obtained by a mining algorithm, depends strongly on quality of data. In the case of web usage mining, this data is user sessions, i.e. the sessions of web site's visitors obtained, with high confidence, from access log. First, the web activity must be assigned to corresponding users. Second, their activity must be further divided into visits. Third, episodes are spotted from a visit. We call these processes user, session, and episode identification, respectively.
- Building Profiles; the basic characteristic is that all kinds of profiles represent most typical usage and content patterns. They do not represent individual profiles or groups of similar users' profiles. They are rather a condensed snap of usage as well as content characteristics. However, normally, out of profiles analysis, some typical groups of users can be extracted, although we must be aware, certain users' characteristics could be covered by several profiles. In other words, profiles are overlapping. Profiles are basically speaking a vector with weights for each page view according to some combination function against corresponding cluster vectors' components.
- Recommendations; for a personalization service to be efficient a real-time coverage must be ensured. In our case, only recommendation service is real-time component, however, data preparation and pattern discovery phase is an off-line task. A user, whether anonymous or registered, is observed by a fix sliding window of clicking series. A very handy approach is that a user short history is represented as a vector of page views, where already seen pages are marked. We compare a current user session to each content or usage profile with some matching function. If no usage profile has a recommendation tip for a user a content profiles can take place or vice versa. We consider mentioned recommendation approach as a complement to classic approaches as collaborative filtering and content-based approach. It is an efficient and effective way to do the best when other approaches fail. Our observation shows promising future for focused recommendation approaches for the e-learning portal.
- Other important horizontal services are:
 - Notification service - this service enhances the concept of sending and receiving various messages inside the portal or externally. In short, this service acts as a mediator for receiving and processing messages, which can be triggered directly by user, by scheduler, or by personalization service. For instance, user wants to receive personalized updates of current assignments, the personalization service sends the information to the user via notification

service, which locates the user by the help of location facility and sends a SMS/MMS if user is in mobile network or ICQ message if user is online on the Internet.

- Location facility - it helps keep a track of user's current location. This can range from specialized location device, which can pinpoint his or her location in geographical coordinates or street locations, to simple location tracking, where current context of a user is used for location (user is online on the Internet, user is accessing the service via GPRS).
- User interface - the problem is how to present the portal to the end user through numerous media (web browser, WAP, SMS/MMS) is hard to tackle. The main difficulty is range of different protocols, standards, and hardware. One would think that for information to be device independent, it needs only a XML encoding and presentation via XSL transformation. In our portal, we started with definitions of basic ontologies that describe arbitrary objects and objects' action. For instance, portal includes an index where links are divided into hierarchical sections. Section can include subsections and actions such as addition and removal of links and sections.
- Search facility - it should incorporate all content and services where result of a search is composite and presented as such to the end user. The precision and recall must be excellent, which can be achieved by using internal information retrieval engine (self-made or text search facility of relational database such as Full Text Search in MS SQL Server or Text Cartridge in Oracle) or external engine, where content is generated statically to be indexed by Internet search engines (Google).

Conclusion

While the personalization is widely accepted in business and service oriented portals, it is less used in e-learning. The fact is that personalization makes the e-learning systems friendlier and can (when implemented properly) significantly diminish the technology barrier effect of the learner's access to the e-learning processes and e-educational institutions. Through the personalization, the learning organizations can help learners to become more familiar – and hence more comfortable with new technology features.

Development of the personalization aspects and techniques has been very fast in recent years, yet the basic goal of personalization systems remains the same: to provide users with what they want or need without requiring them to ask for it explicitly. Personalization is the provision to the individual of tailored products, services, information or information relating to products or service. It is a broad area, also covering recommender systems, customization, and adaptive Web sites. However, real time personalization will most likely be required in order to sustain a competitive advantage through the use of personalization technology. Real time personalization reacts each time the user clicks the mouse, generating only relevant content for the user. A major role in the e-learning portals will also play the location facility and the notification service that do not depend on the devices, protocols and on the type of access. This also means an upgrade of **e-learning to m-learning** (mobile learning) which is becoming a reality nowadays.

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Author

Dr. Dejan Dinevski, Ass. Prof.
Head of Department of University Information and Technology Development
University of Maribor
Slomskov trg 15, 2000 Maribor, SLOVENIA
dejan.dinevski@uni-mb.si

THE INFLUENCE OF THINKING STYLE AND MODELLING HINTS ON PERSONALISATION OF HYPERTEXT BROWSING

*Lorenzo Fiorina, Barbara Colombo, Annella Bartolomeo & Alessandro Antonietti
Catholic University of Sacred Heart, Milano*

Introduction

Hypertext documents represent about 75% of the whole Web contents. This can explain why researchers and educators are highly interested in the psychological aspects of hypertext navigation. Their attention has been focused on the effects coming from the use of hypertext in e-learning and ODL. A widespread idea is that these effects have to be investigated, so that positive features of hypertexts can be disclosed and encouraged and negative features can be removed.

Several studies examined the effects on learning yielded by hypertext navigation, showing that a non-linear way of presenting topics can produce advantages in comparison to traditional linear ways (Crosby & Stelowsky, 1994; Frey & Simonson, 1994; Chou & Wang, 1999; Lin, Liu & Yuan, 2001; Lu, Yu & Liu, 2003). Reasons of these effects should be found in the particular structure of the hypertexts which permits learners to navigate the contents according to the preferential way and according to the personal thinking style. Choosing the navigational path according to the personal style should make the learning process easier, raising individual motivation and level of activity (Ayersman & Minden, 1995).

Consistently with these suggestions, some authors (Liu & Reed, 1995; Kim, 1997; Pillay, 1998; Palmquist & Kim, 2000; Buch & Bartley, 2002) found that persons with different cognitive styles, if allowed to browse freely a hypertext, use different surfing strategies. However, hypertexts may not always grant benefits, as showed by experiments in which a subsample took advantage of the non-linear navigation, whereas other participants encountered problems in using the hypertext and preferred a linear and sequential path (Dewar & Whittington, 2000; Federico, 2000; Buch & Bartley, 2002). Furthermore, lack of connections among thinking style, browsing patterns, and learning outcomes were often reported in literature (Liu & Reed, 1994; Wilkinson, Crerar & Falchikov, 1997; Yu Ting & Underwood, 1999; Ford & Chen, 2001; Shih & Gamon, 2002). These contradictory results stress the need to investigate specific styles in depth.

The most widely studied style is field-dependence/independence. Differences between field-independent and field-dependent subjects in non-linear learning were found (Korthauer & Koubek, 1994; Chang, 1995; Andris, 1996; Durfresne & Turcotte, 1997; Reed & Oughton, 1997): Field-independent people take more profit from the navigation of a hypertext than field-dependent individuals.

More recently, relationships between hypertext navigation and another style – that is, the left-right thinking style – were investigated. Left-right thinking style is conceptualised with reference to the patterns of functions typical of the two brain hemispheres. The left style is associated with logical-analytical thinking and implies preference for sequential processing of information and systematic approach. Right style refers to holistic thinking and implies preference for intuitive, parallel processing. A third style (integrated style) is proposed to describing persons who equally show both the characteristics. Antonietti and Calcaterra (2001) recorded how undergraduates browsed a hypertext and found that navigation behaviour was linked to computer skills rather than to the left-right style and that learning outcomes were unaffected by thinking style. However, learning outcomes were positively affected by specific search patterns, such as re-visiting hypertext sections and visiting overview sections in the early stages of hypertext browsing. Furthermore, navigating overview sections and holistic processing fostered knowledge representation in the form of maps rather than sequential

schemata. These findings suggest that stylistic differences can affect hypertext navigation even though their role has to be thoroughly assessed.

The purpose of the current study was to better understand the relationships between the left-right thinking style and browsing patterns, by verify whether surfing behaviour during the navigation of a hypertext – which differs from that employed in Antonietti and Calcaterra's (2001) study – is associated with the left-right style or is associated to other factors, such as modelling hints.

Methods

A hypertext concerning Iceland was devised for the study. It was navigated by 200 adults (100 males and 100 females) who were assigned to one of two groups, each characterised by a specific kind of modelling tasks involving the functions of either the left or the right thinking style. These tasks had to be performed before the navigation of the hypertext. After the navigation, subjects were invited to fill a self-report inventory aimed at measuring the left-right thinking style. All materials were hosted on a web site. Participants were asked to pass to the following part of the web site only once accomplished the required assignments.

Modelling tasks

Two groups of 4 different initial tasks were created in order to elicit the functions of either the left or the right style. The first group of tasks was specific for the left-thinking functions and included linguistic, logical, and analytic games. The first game consisted of a list of animals and products, among which participants had to choose the ones that they thought were typical of Iceland. The second game required to schedule a hypothetical tour of Iceland, using a map to retrieve textual information about the places mentioned. In the third game participants had to check the alien among a list of North-European capitals. The fourth game demanded to complete a sentence by inserting the missing words.

The second group of tasks, involving the right-thinking functions, was constituted by games requiring the use of imagery and intuition. The first game asked subjects to list countries they associated with Iceland. In the second game participants had to list ten objects that might result useful during a hypothetical trip to Iceland. The third game required to associate freely the word "Iceland" to five words. The last game asked to think of possible associations between famous persons and localities of Iceland; Localities were pointed on the map of Iceland, but in this case participants had to browse pictures instead of reading texts.

Hypertext navigation

The hypertext consisted of 150 pages, divided into 8 thematic sections. Five major sections concerned topics linked to Iceland (Art and Culture, Photograph Gallery, Reykjavík – The Capital, Icelandic Recipes, Trekking Route) whereas the 3 remaining sections were single-page documents presenting (i) links to web sites related to Iceland, (ii) a Research tool, and (iii) the Map of the Site. Participants were asked to access every major section. However, basic score for a valid navigation had been fixed in visiting at least 10 pages and in reaching an overall minimum navigation time of 3 minutes.

Thinking style assessment

After the hypertext navigation, participants were administered Torrance's (1988) "Style of Learning and Thinking" (SOLAT), a questionnaire usually employed to measure the overall preference for a thinking style (left vs. right). It consists of 28 items, each reporting a pair of statements, one referred to the left and the other to the right style of thinking. Subjects have to place a check mark whether the statement is true of them; they may check one or both of the statements in a pair or neither. Distinct measures for the left and right styles are computed so to assess the relative dependence of an individual either on the left or on the right mode of thinking (a third possibility is that people show an integrated style since they score equally in the left and right scales).

Results

Performance in each task

Modelling tasks

Participants carried out the tasks according the given instructions. This part of the procedure was considered valid when 3 out of the 4 tasks were completed by participants.

Hypertext navigation

Within the set of all the browsing variables recorded we identified the most informative variables: the total number of navigated pages, the overall navigation time, the total number of returns to previously navigated pages. More detailed variables were obtained applying these criteria to the home page and to the 8 thematic sections of the hypertext.

Thinking style assessment

To identify the preferred style, the number of items in which each participant chose the left statements was subtracted from the number of items in which the right style statement was endorsed. Low, medium and high levels of right style score were assessed by assuming the 33.3 and 66.6 percentiles of the frequency distribution of the scores obtained by means of the previously mentioned algorithm as cut-off points. Subjects who obtained a low score were classified as left thinkers. Participants who obtained a high score were classified as right thinkers. Persons who had intermediate scores were classified as integrated thinkers. The three categories of participants (left, right and integrated thinkers) resulted to be equally distributed in the two modelling groups.

Relationships between the tasks

Influence of the modelling tasks on hypertext navigation

Statistical analyses supported the influence of the initial modelling tasks on hypertext navigation variables. Participants who completed the left-thinking style tasks navigated more pages, made more returns and surfed the hypertext for a longer time than participants who completed the right-thinking style tasks. By considering the separate sections of the hypertext, significant associations between the time spent in browsing the section (as well as the number of pages visited and the number of returns to previously visited pages) and the kind of the initial task emerged: the left-thinking style tasks prompted at surfing a higher number of pages and at making a higher number of returns. Participants who performed the right-thinking style tasks made a higher number of discontinuous surfing sequences.

Influence of the thinking style on hypertext navigation

Analyses failed to support any significant correlation and also ANOVA induced to discard possible connections between thinking style and navigational behaviour.

Influence of other variables on hypertext navigation

Gender affected surfing patterns: Male participants navigated more pages and made more returns whereas females spent more time in navigating the hypertext. Participants' frequency of daily computer use was negatively correlated to the time spent in visiting the home page: Such a result is not surprising since people who are less experienced in computer use take more time before starting to navigate since they tend to read initial instructions accurately.

Conclusions

Differences in participants' ways of navigating the web site emerged. Analyses indicated that the initial modelling experience was the most influencing factor. The surfing hints affected hypertext browsing at different levels, mostly by producing differences in the navigation time. By contrast,

relationships between navigational variables and left-right thinking style failed to emerge. Presumably the effects of the initially-provided prompts overwhelmed the role played by thinking style in orienting participants' surfing path. More precisely, the initial tasks might have temporarily "imposed" to participants a way of browsing the unknown contents of the hypertext which induced them to follow either a logical-sequential path or a holistic-intuitive approach, irrespectively of the fact that such a way matched or mismatched the personal style of thinking.

Implications of these results are twofold. On one hand, they cast doubt upon the alleged association between style and hypertext navigation. Even though people were left free to surf the web site according to their own way of thinking, they failed to show browsing patterns which were consistent with their personal cognitive preferences. As far as the left-right style is concerned, this conclusion – suggested by a previous investigation (Antonietti & Calcaterra, 2001) – was supported also by the present study. This induces us to reconsider one of the benefit produced by hypertext that educators often mention, namely, the possibility to personalise knowledge access.

On the other hand, findings stress the role that the initial experience has in modelling the following surfing behaviour. This leads us to ask whether the effects produced by completing an initial task are limited to the navigation of a hypertext or also occur in using other media. Responses to this question may have relevant implications both for educational software developers (who are in charge to design tools which prompt the most effective learning strategies) and for teachers, instructors, and trainers (who should devise individualised learning paths). Further research is needed to generalise conclusions about the effects of such kinds of hints.

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Authors

Lorenzo Fiorina
Department of Psychology
Service of Psychology of Learning and Education
Catholic University of Sacred Heart
Largo Gemelli 1, 20123 Milano (Italy)
fiorina@tiscalinet.it

Annella Bartolomeo
Department of Psychology
Service of Psychology of Learning and Education
Catholic University of Sacred Heart
Largo Gemelli 1, 20123 Milano (Italy)
annellab@tiscalinet.it

Barbara Colombo
Department of Psychology
Cognitive Psychology Laboratory
Catholic University of Sacred Heart
Largo Gemelli 1, 20123 Milano (Italy)
barbara.colombo@unicatt.it

Alessandro Antonietti
Department of Psychology
Cognitive Psychology Laboratory
Catholic University of Sacred Heart
Largo Gemelli 1, 20123 Milano (Italy)
alessandro.antonietti@unicatt.it

eLEARNING: FRAMEWORKS, CONTENTS AND STANDARDS

Ottó Hutter, Terézia Sárváry, István Simonics & Balázs Wagner, Hungarian Academy of Sciences

1. Introduction

Computer and Automation Research Institute, Hungarian Academy of Sciences – further SZTAKI – has a really good and well-known international technology/research background. Because of this good track record SZTAKI has received the EU Centre of Excellence in Information Technology and Automation status. According of these experiences the staff of the Database Management System Department is involved in several EU Leonardo, and Hungarian Info-communication Technology projects. We started to monitor the local eLearning market, we elaborated studies, the managers of the department having membership in several eLearning committees. Our Department is organizing eLearning Forum quarterly, we invite the potential developers and users all over from Hungary. In June 2003 there was the 3rd meeting of the Forum in SZTAKI. In ECDL – European Computer Driving License – and Linux training, using our experience in distance education we developed and applied blended learning packages; we employ qualified tutors and distance education managers.

The domestic eLearning projects have a typical weakness so far, that the created training materials can be used only in a specific framework. It is a big constrain and this is why we decided to build up a systematic method to overcome this problem. We selected three main area in our activity to measure the frameworks, the content and standards. Our aim is to create a portable database system which can support the wide use of eLearning training materials the globalisation and localisation. We present the development process and our efforts in the implementation process.

2. Methods

2.1. Survey of framework systems

It was really important to know, which companies and institutes are developers and users in the Hungarian eLearning market. But we did not a simply survey to make an inventory, but we were interested in details, what framework system, which software and hardware are used. We edited a questionnaire and could collect the relevant data from 12 companies, which have a leading role in the training market. The questionnaire consist of 10 sections: system requirements on the server/client side, presentation tools, courseware components, on-line/off-line courseware development, teacher tools, management roles, and others.

These companies are using their own framework system, or internationally sold software for eLearning solution:

- Cisco,
- EDUWEB,
- HP – Easy Generator,
- KREA,
- Silicon Graphics – WebCT,
- Synergon – Poenix,
- IBM – Lotus LearningSpace,
- BioDigit Kft.,
- BME-ELTE-Mimóza,
- Oracle – iLearning,
- SAP – Learning Solution
- Számalk – Qualitycator

The Comparison table of frameworks/systems can be seen on our website: www.sztaki.hu/dms

We invited the representatives of these companies to our eLearning Forum and they could present their framework systems and gave several applications as well. The events of our Forum accelerated to build up partnership among the detached development workshops and laboratories.

2.2. Analyses of the architecture of the typical eLearning systems

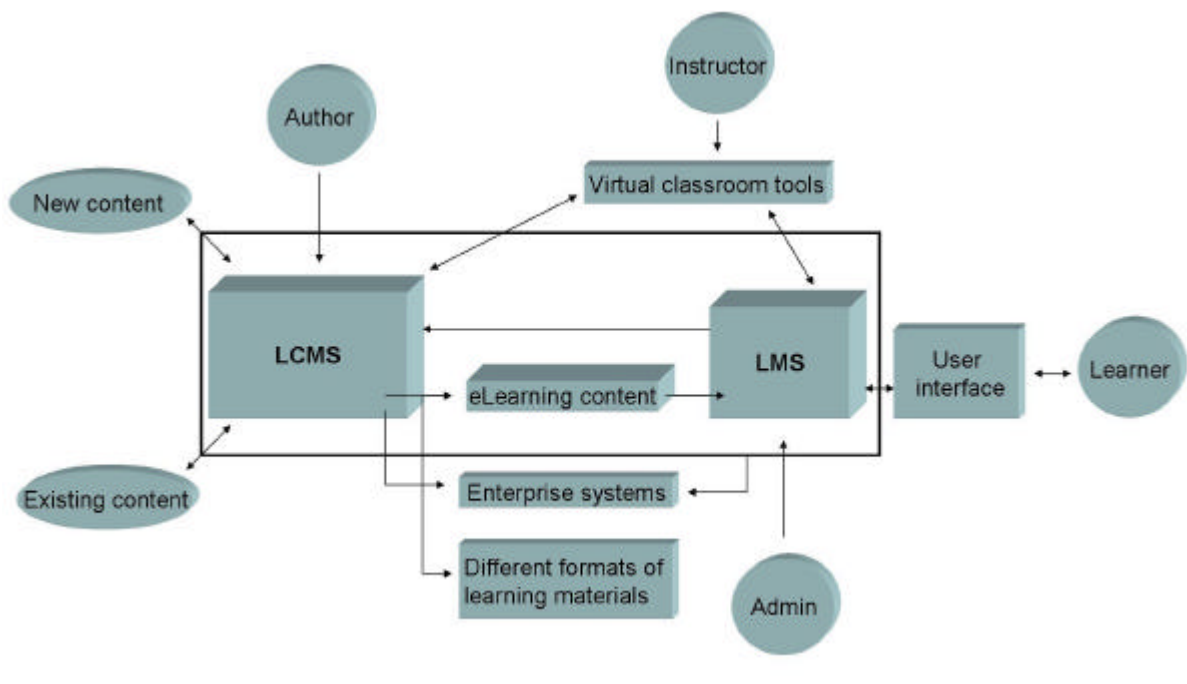
When we started to analyse the core elements of eLearning training materials based on our framework survey we have identified the following components:

- pictures,
- voice,
- video,
- animation,
- and HTML, XML editing.

We have built up a functional model on analysing the system components as are follows:

- Text, multimedia elements of the courseware
- Learning content management systems (LCMS)
- Courseware database
- eLearning management system (LMS)
- Content developers/students/trainers/tutors

The figure below helps to discover the connection among the elements.



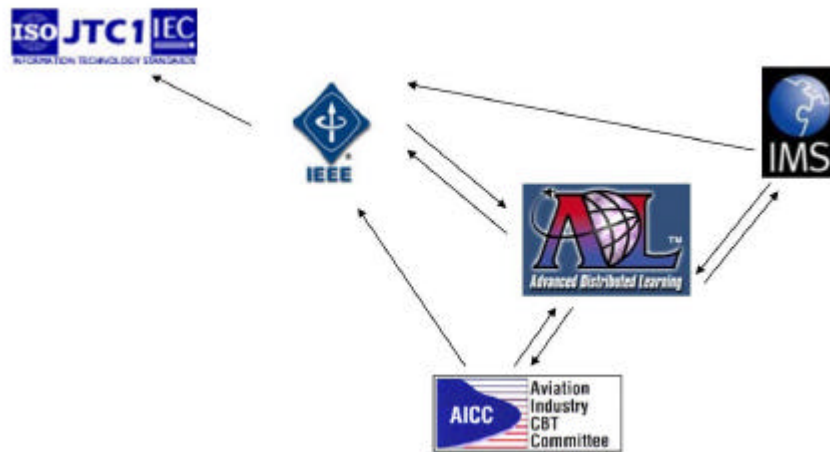
Using our development platform we have realized that it was too difficult, expensive and time-consuming to develop new export and import modules when we had to transfer the training material from one framework system to another one. Parallel with this development process we started to study and collect all the data about the standardisation on eLearning training materials.

2.3. Analysis of the eLearning standards

There are several standards regarding learning technologies. Some of them are not so frequently used, so we collected the most common and important ones:

- ISO/IEC Joint Technology Committee Subcommittee on Standards for Learning, Education, and Technology
- IEEE Learning Technology Standards Committee (LTSC)
- Advanced Distributed Learning Initiative
- IMS Global Learning Consortium
- Aviation Industry CBT Committee (AICC)

International organizations and bodies establishing and managing standards are shown in the next figure.



According to our model we selected the relevant standard systems on groups of information.

Metadata

- Dublin Core
- IMS Learning Resource Metadata
- IEEE LOM

Courseware package format

- SCORM Content Packaging
- IMS Content Packaging

Framework-courseware communication

- AICC CMI Data Model and API
- SCORM Run Time Environment

ERP integration

- IMS Enterprise

Student data

- IMS Learner Information Profile

Test modules

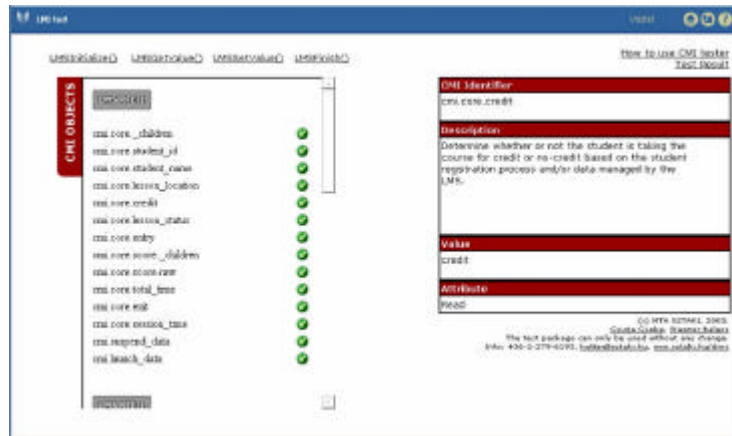
- IMS Question & Test Interoperability (QTI)

3. Courseware portability in practice

3.1. Market analysis – CMI tester

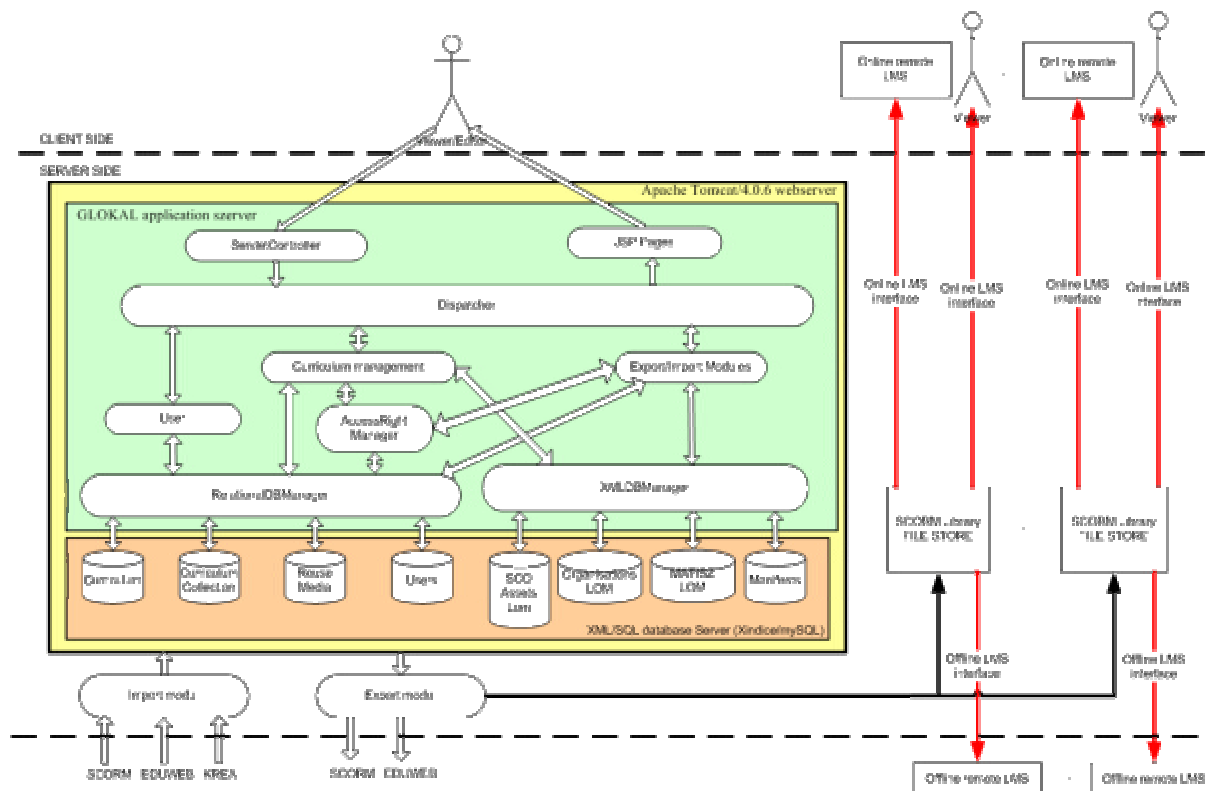
It was mentioned formerly, MTA SZTAKI set itself the aim of the continuous monitoring of the Hungarian market as the part of its expert activity in connection with eLearning. In addition to the survey of framework systems we pay particular attention to the eLearning systems with significant market participation in what kind of extent support the portability of the learning content.

We started to analyse the CMI – Computer Managed Instruction – system. It is really important to support students in the learning process. Through CMI calls we can inform about the students, follow them in the implementation of learning process, store the results of tests etc. This supports also the cross communication between the training material and the framework. This is a core part of Run Time Environment – RTE. Towards the more exact survey of the systems in the aspect of standards we developed a little test system called “SZTAKI CMI Tester”. The communication between the framework and the learning content can be analysed in very detail with the help of this tool, and the compatibility level of the framework can be qualified too. This test system can be freely downloaded from our web site (www.sztaki.hu/dms) as a standard SCORM content package. The package loaded into the framework automatically appears a test side and the CMI processes are listed, after all of them visualizes that the framework supports the given process or not i.e. our developed tester evaluates the CMI calls in the framework system and makes several classifications based on SCORM. According to these classifications we can test the adaptations of Learning Objects Metadata –LOM etc. At the moment we have made circumstantial test in the following frameworks: ADL RTE 1.2, Microsoft LRNViewer 3.0, Oracle iLearning 4.2, SAP Learning Solution, Számalk Qualitycator.



3.2. SZTAKI SCORM LCMS

In addition to the monitoring and testing of the wide-spread frameworks from the point of view of standards we deal with creating SCORM compatible learning materials. We developed a complex content developer infrastructure called SZTAKI SCORM LCMS. For the time being this system is used for supporting our work, but we plan to open it for public usage during 2004, it is possible that the system will be an ASP service.



As the attached block scheme shows the SZTAKI SCORM LCMS is an XML/SQL database platform with web based editor and administration modules, workgroup supporting tools, the key of the portability the Export/Import modules and a learning material library which can be accessible through the web.

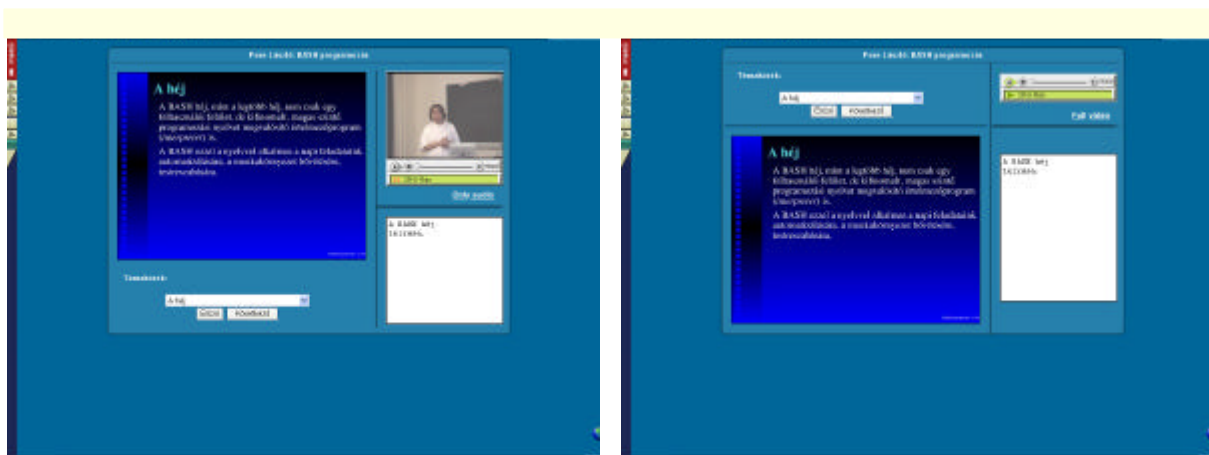
The database platform has a native SCORM support which means that the inside database structures are completely suitable for the learning material structure specified in the SCORM package specification and the LOM metadata structures. Considering the present technology of the system it is based on Linux/Java platform with MySQL and Xindice database management system.

To any elements of any pages in the learning material being in the database can be assign write/read right separately and in groups too. On the bases of this the in the distance working content developers can upload and replace the content elements (assets, SCOs) according to their right, and they can modify the structure of the learning material.

Of course the export-import modules are able to generate SCORM 1.2 compatible packages from the learning materials being in the database and import this packages, but over and above this we support some not standard and then again some special learning material format of popular eLearning framework being in the home market in the interest of the practice portability.

The SCORM eLibrary module is a SCORM compatible “store” of training packages users can view and download according to their rights. System does not support the interaction, but it is a cheap entry point to the deployment of SCORM compatible learning materials. The next step can be the usage of a professional SCORM compatible Learning Management System.

The SCORM standard does not contain specification concerning the layout, inside structure of the pages of the learning materials, but in the practice, during the development of the learning material, it is practical to define learning material templates to the typical learning material-types and the content development can be speed up with the usage of those. The modules of the SZTAKI SCORM LCMS Page Editor support the quick construct of the pages of the learning material. In connection with this we would like to point out our learning material structure by the fantasy name of “sPresentation”. sPresentation is an effective presentation technology for „Lecture oriented” courseware. Synchronous playing and browsing in the video/audio stream and multimedia elements (JPG, slides, demo video shots, etc.)



Flexible technology

- Real Player, Microsoft Media Player, standard MPEG support
- Of-line and on-line environment
- Easy-to-use development environment supporting the synchronization of stream position and multimedia elements.

4. Summary

We have presented the main concept of a standard based eLearning content development methodology, based on the results of the eLearning department of MTA SZTAKI. We have summarized the results of our market survey about the standardization support of relevant eLearning platforms, and also presented our own standard based content development platform.

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Authors:

Ottó Hutter, Terézia Sárváry, István Simonics & Balázs Wagner,
Department of Database Management System,
Computer and Automation Research Institute,
Hungarian Academy of Sciences MTA SZTAKI,
H-1111 Budapest Lágymányosi u. 11., Hungary
hutter@sztaki.hu,
sarvary@sztaki.hu,
simonics@sztaki.hu,
wagner@sztaki.hu