

„Learning Processes of Student Teachers concerning the Integration of Experiments in Chemistry Instruction“ by Jana-Katharina Dressler

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Scientific inquiry is integrated into chemistry education as a basic competence. Thereby, “the experiment is the key feature of science methods of investigating ‘nature’” (Tesch & Duit, 2010, p.17). In chemistry instruction, the experiment should be used as a tool to prove hypotheses by purposeful observation. Studies show that pupils’ understanding of why experiments are important for scientific investigation can only be enhanced if experiments are integrated into regular classroom practice using this experimental method. The design of such chemistry lessons implicates high expectations on teachers’ abilities to create a classroom environment in which pupils can experience this kind of experimentation. (Tesch & Duit, 2010) Therefore, teachers need specific knowledge, e.g. pedagogical content knowledge, concerning the integration of experiments in chemistry instruction (Shulman, 1986).

To be prepared for in-service teaching, student teachers should gain this knowledge at university by combining theoretical knowledge and practical experiences. These practical experiences can be gained in practical school trainings (KMK, 2004). Empirical results on the effectiveness of practical school trainings on the learning processes of student teachers are not verified sufficiently (Stürmer et al., 2013).

From this empirically identified necessity, this qualitative case study is carried out. The study analyses student teachers’ individual learning processes concerning classroom experiments as well as their reflections on them within practical school trainings.

The study pursues the following research questions:

Level of learning process 1: Which changes can be described concerning students’ content knowledge on specific topics in chemistry education, beliefs about classroom experiments and pedagogical content knowledge of classroom experiments?

Level of learning processes 2: Which changes can be described concerning the students’ usage of pedagogical content knowledge while reflecting on classroom videos that show chemistry instruction by experiments?

Level of learning processes 3: Which changes can be described concerning students’ perception and interpretation of pupils’ learning processes during experimental lessons?

To investigate these research questions, three different instruments were used in a mixed-method-design: a written assessment tool, a guided interview using a video vignette as stimulus and documentation sheets of learning opportunities. By triangulating the data of these instruments, detailed analyses of students’ individual learning processes are feasible.

References

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