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Portfolios as a way of documenting and reflecting learning processes in a mathematics teachers’ professional development program

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Theoretical framework

Inclusion is one of the current challenges in the education system. Because of its complexity, inclusion in secondary education increases the need for subject-specific teaching development and corresponding measures for teacher professionalization, e.g. in form of teacher professional development (PD) programs. The knowledge about individual learning processes of teachers participating in a PD program is fundamental to organize a professional learning development systematically and effectively (Prediger, Leuders, & Rösken-Winter, 2017). Therefore, we are interested in what and how teachers learn when participating in a PD program on inclusive mathematics classes.

How to make teachers’ learning processes visible within a PD program?

In general, only a few studies focused on the processes of teachers’ learning (Goldsmith, Doerr, & Lewis, 2014). First of all, the question “How to make learning processes visible?” aroused our interest. Schunk (2012) specifies different methods of investigating learning, for example with the help of a self-report. Portfolios can be used as one method of documenting and structuring self-reports. Learners can use portfolios to observe, document and reflect their learning progresses as well as to plan further learning steps (Gläser-Zikuda, Fendler, Noack, & Ziegelbauer, 2011).

In this study we based our considerations on the extended process-model of self-regulation (Schmitz & Schmidt, 2007). This model uses the basic assumption that self-regulation “refers to self-generated thoughts, feelings and actions that are planned and cyclically adapted to personal goals” (Zimmerman, 2000, p. 16 as cited in Schmitz & Schmidt, 2007, p. 11). One important element of this idea is the pursuit of goals during three learning phases: pre-actional, actional and post-actional (see Figure 1).

Figure 1: Extended process model of self-regulated learning
During the pre-actional phase the learner compares his situation with the desired goal and defines steps for achieving the goal (Gläser-Zikuda et al., 2011; Schmitz & Schmidt, 2007). In the actional phase the learner tracks his goals and in the post-actional phase he reflects his learning process and evaluates it by comparing the actualized status with his expectations at the beginning (ibid.).

**Method**

In order to uncover teachers’ learning processes within a PD program, we understand self-regulated learning as a tool for developing reflection tasks as a basis for the work with portfolios. The creation of the reflection tasks is based on the PD program content and refer to the cyclic interplay of pre-actional and post-actional phase as explained above. At the moment we can rely our research on three portfolios, which were filled out at distance of six to eight weeks each. In the first portfolio (PF1), teachers wrote down a personal learning goal, which they want to achieve through the whole PD program, and formulated planning steps for achieving it (pre-actional). Within the second portfolio (PF2) they wrote down, which steps they made and how they evaluate their learning process (post-actional). In this context the teachers also looked back to what experiences they made in their inclusive mathematics classes (post-actional). Afterwards, they planned further steps for getting closer to their desired goal (pre-actional). In portfolio three (PF3) the teachers were asked to formulate their personal learning goal again, with or without a modification based on their previous experiences (post-actional). Finally, they planned again how to pursuit their learning goal (pre-actional).

**Results**

With the help of case examples, typical teachers’ answers are going to be introduced aiming at the discussion of further development and reflection of our portfolios as a research method. For example one teacher formulates the personal learning goal that she wants to prepare lessons at different levels of learning. She plans to reach her goal within the topic of percentage calculation (PF1, pre-actional). Later on she writes that she had used different methods with her pupils and she describes her learning process as being in flow (PF2, post-actional). She still wants to prepare a lesson in cooperation with a colleague (PF2, pre-actional). At last, she describes which aspects of lesson preparation she wants to improve (PF3, post-actional) and in which aspects she wants to work on collaboratively (PF3, pre-actional). All in all, we would like to discuss our portfolios, based on the self-regulated learning model, used as a possibility for making teachers’ learning processes within a PD program visible.

**References**


