



Formative Assessment in Mathematics Education by Primary School Teachers

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Introduction

Formative assessment (FA), which is assessment with the intention to adjust instruction to students' needs, has been found to be relevant for raising students' achievement [1]. Therefore, it is important to gain insight into the application of FA in education. This study, as part of the EU-funded FaSMEd project, contributed to insight into FA practices by means of interviews with teachers.

Previous studies have revealed that teachers gain insight into their students' understanding in several ways, such as by asking questions or observing students [2,3]. Collecting information is followed by interpretation and taking action to facilitate student achievement. These consecutive steps have received far less attention in former studies than the collection of information. We investigated both the phases of collecting information and taking action. Teachers' perceived competence and support from their professional environments in FA were also included, because these factors influence the teachers' use of FA [4,5]. Finally, we asked the teachers about their use of ICT, as digital means become increasingly important in educational practice.

Research questions

1. Which FA methods do teachers apply to collect information about their students' mathematics performance?
2. Which consecutive steps do teachers take based on the collected information?
3. Do teachers feel competent and supported in their FA practices in mathematics education?
4. How do teachers use ICT for FA in mathematics education?

Method

- 14 teachers (12 female; 2 male) from various primary schools.
- Semi-structured interviews based on FA methods and assessment steps from research literature [6].
- Interviews were recorded and transcribed verbatim. Transcripts were then analysed to generate results.

Results

1. Which FA methods do primary school teachers apply?

- Instrument-based methods, such as using tests of a Student Monitoring System and textbook tests, were named most often (79%), and named first by many teachers as sources of information.
- Observation-based methods, such as observing students and asking questions, were also often named (64%).
- Finding out which strategies students used was considered particularly important.

2. Which consecutive steps do teachers take based on the information?

- Teachers reported a stepwise course of actions after collection of information: they consecutively registered and interpreted the information, passed their findings onto students and other teachers, and adjusted their instruction.
- Teachers adjusted instruction for the entire class, or for individual students, dependent on students' needs.
- Adjustments could consist of adjusting the teaching pace, repetition of instruction, or elaboration on particular topics.

3. Do teachers feel competent and supported in applying FA strategies?

- All teachers felt competent in FA, but many (93%) thought it would be useful to take professional development courses on the topic.
- Support in FA from the school was not always perceived as adequate. One third (31%) of the teachers explicitly stated that they would like more school-wide attention for FA.

4. How do teachers use ICT for FA in mathematics education?

- Most teachers (85%) used ICT to support FA. Digital blackboards were used during whole-class activities (62%), and some teachers assigned mathematics problems digitally (54%).
- Most teachers (85%) wanted to make more use of ICT, but lacked time or knowledge to do so. These teachers suggested to facilitate ICT-use through school-based support.

Conclusions

This interview study revealed that the involved primary school teachers make elaborate use of FA in their classroom practices. Although the teachers often mentioned instrument-based methods (student monitoring- and textbook tests) in the first place, they also made use of methods that have been found as effective for raising student achievement such as observing students and asking questions [2]. The steps the teachers took after collecting information were stepwise and matched the FA cycles described in research literature [6]. Although the teachers felt competent in their FA practices, they expressed a need for professional development on this topic, as well as school-wide attention for FA. They also reported they wanted school-based ICT-support to help them make more and better use of ICT facilities.

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