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# **An in-service training to support teachers of different professions in the implementation of ‘inclusive education’ in the mathematics classroom**

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## **Introduction**

In the German project “GLUE – Gemeinsame LernUmgebungen Entwickeln” (‘developing collaborative learning environments’), an in-service program was developed with the aim to support teachers of different professions (special needs teachers, school teachers) in the implementation of inclusive mathematics education. The program is based on a German website (pikas-mi.dzlm.de), which provides teaching resources and instructional materials for an inclusive mathematics classroom. These materials enhance existing conceptions of mathematics teaching (e.g. Scherer, Beswick, DeBlois, Healy, & Moser Opitz, 2017). In the focus is the development of ‘collaborative learning environments’ for diverse learners to enable every child to participate in mathematical activities, as these are main characteristics of the definition of ‘inclusive education’ in this project.

### **The main features of the in-service program:**

- 1) Self-directed web-based learning is combined with workshop activities (*blended learning*).
- 2) The *workshops* include theoretical inputs as well as practical examples of ‘collaborative learning environments’ for diverse learners in an inclusive mathematics classroom.
- 3) During the workshops participants will adapt, develop, explore and reflect ‘collaborative learning environments’ for their own classes (*transfer from theory to practice*).

Well-founded design elements for in-service trainings for teachers will be taken into account (Barzel & Selter, 2015; Borko, 2004).

## **Research design**

The GLUE-project faces research interests on the *level of design* – with the aim of designing an effective in-service training – and on the *level of research* to evaluate the effectiveness.

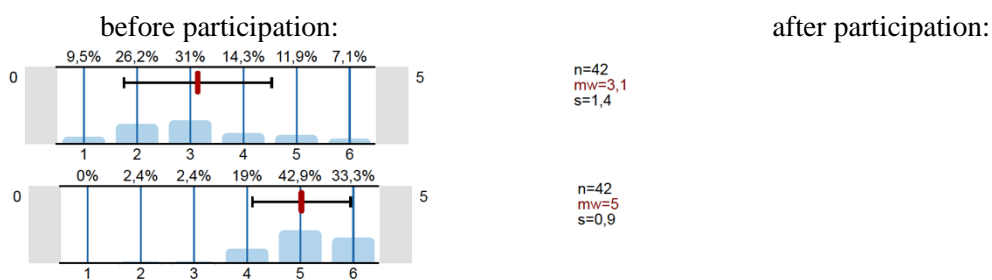
All together one-hundred teachers will participate in the study. One half of these participants are special needs teachers, the other half are primary and lower secondary school teachers, to encourage collegial support and reflection between different professions (Bräuning & Nührenbörger, 2010; Wember, 2013). All participants are split in two groups: treatment group and control group.

A *pre-post-follow-up-test design* includes standardized questionnaires (quantitative) and interviews (qualitative) to gain information about the participants' *self-efficacies*, *adaptive mathematical didactical competencies* and their *attitudes* towards inclusive education before and after their participation, to evaluate the effectiveness of the program. Also, the *acceptance* towards the developed in-service program gets surveyed (see exemplary items below).

## First results

Until now, the in-service program of the treatment group and the analyses of first pre- and post-tests have started. The first results indicate some high effect sizes concerning the perceived *self-efficacy* by the target group, as the following questionnaire-items show.

**Exemplary item 1:** *I know instruments for the diagnostically founded support of mathematical competences (e. g. four-phases model).*



**Figure 1: Results of item 1 (paired sample: p-value <0,00; d = 1,500758; effect size high)**

**Exemplary item 2:** *I can adapt instruments for the diagnostically founded support of mathematical competences (e. g. four-phases model) to plan my lessons for the inclusive mathematics classroom.*



**Figure 2: Results of item 2 (paired sample: p-value <0,001; d = 1,001214; effect size high)**

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