Supporting future mathematics teachers to work in linguistically diverse classrooms

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Introduction

The current study is part of the state funded project ‘Professional teacher actions to promote subject-related learning under changing social conditions’ (ProfaLe). Goals are amongst others (regarding mathematics education):

• to promote future mathematics teacher’s noticing of language barriers within mathematical learning processes and while working on tasks,
• to promote professional competence in helping students to tackle these learning barriers.

Overall aim: to develop, evaluate and implement university courses, which integrate aspects of language learning into mathematics education.

Research questions

Which linguistic aspects of teaching and learning mathematics do prospective mathematics teachers notice?

How is the noticing of linguistic aspects in the mathematics classroom related to beliefs about the role of language for teaching and learning mathematics?

Do additional opportunities to learn concerning linguistic diversity during an intervention phase promote prospective teachers’ professional competence?

Theoretical background

• International large-scale studies like PISA and TIMSS have repeatedly shown that there are strong correlations between language proficiency and the mathematical performance of students.
• Especially academic language skills have proven to be vital for educational success, as they are required at school and also in mathematics classes (Gogolin et al. 2013).
• Language has a communicative and cognitive function for learning mathematics (Maier, Schweiger, 1999) and is essential for developing mental models of mathematical concepts.
• Language is seldom addressed explicitly in ordinary classroom activities. In order to offer students equal educational opportunities, present educational practices need to be reshaped (Schütte, Kaiser 2011) as well as teacher education.
• Based on a model for developing competencies by Blömeke et al. (2015) and the concept of noticing (Sherin et al. 2011), opportunities to learn will be created and the effectiveness of them will be evaluated, e.g. with the help of video-vignettes.

Design / Methods of the study

Pilot study:
data collection (7 prospective teachers)
Analysis of data (qualitative content analysis), improvement of interventions and methods
Main study: data collection (about 40 prospective teachers)
Analysis of data (qualitative content analysis)

Figure 1: Modeling competence as a continuum (Blömeke et al. 2015)

References: