Introduction

The current PhD-study is part of the state funded project ‘Professional teaching practice 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.
• 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 beliefs about the role of language for learning and teaching mathematics do future teachers hold?

Which aspects of language in learning and teaching mathematics do prospective mathematics teachers notice and how do they react in specific situations?

Which relations exist concerning the awareness of the role of language in mathematics learning and teaching before and after an intervention?

Theoretical background

• There exists a relation between the first language, language proficiency and the mathematical performance of students (PISA, TIMSS, etc.).
• In mathematics classes different language registers (Halliday, 1978) are needed and used: everyday language, mathematical language and a language register described by Gogolin as academic language (so-called ‘Bildungssprache’).
• ‘Bildungssprache’ comprise language skills at word, sentence, text and discourse level to decode and communicate abstract and complex contents (Gogolin & Duarte, 2016).
• Language has a communicative and cognitive function for learning and doing mathematics (Maier & Schweiger, 1999).
• Although teachers should promote language skills according to the German national standards, language is seldom addressed explicitly in ordinary classroom activities (Schütte & Kaiser, 2011).
• Beliefs comprise affect and cognition and influence teaching practice at school as well as future teachers’ learning at university (Schwarz, 2013).

Design of the study

Main testing instrument: structured interviews about the role of language for learning and teaching mathematics structured interviews about a videotaped situation in mathematics classroom

10/2016 – 02/2017

Pre-test G1

Post-test G1

Pre-/Post-test G2

Pre-test G3

Written documentation of focused observation tasks during school internship

Analysis of data (qualitative text analysis)

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

References:


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