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Learning from Lessons: A study on structure and construction of mathematics teacher knowledge – First results of case study

Judith Huget and Andrea Peter-Koop

Bielefeld University, Faculty of Mathematics, IDM, Germany; jhuget@math.uni-bielefeld.de

Keywords: Teacher learning, teacher attention, teacher knowledge, mixed methods, international comparison, mathematics lessons.

Introduction

Teachers are not only learning professionally during their university training; their learning continues and shifts to professional development programs and their own classroom practice. Understanding the teacher learning process should therefore help improve teacher knowledge and development at all levels (Chan, Clarke, Clarke, Roche, Cao & Peter-Koop, 2018). “Learning from Lessons”, a project about studying the structure and construction of mathematics teacher knowledge, aims to “understand teacher in situ learning” (ibid, p. 91) by generating and analyzing data on the teacher’s adaptation of a pre-designed lesson, planning a follow-up lesson and comparing the collected data from three different countries. In this poster the theoretical background of the study, the research questions and the extensive international data collection will be presented and first results from the German case studies will be introduced and discussed.

Theoretical background and following research questions

The theoretical background is based on the non-linear “interconnected model of teacher professional growth” initially developed by Clarke and Peter (1993) and elaborated on by Clarke and Hollingsworth (2002). In this model (see Fig. 1), teacher learning is determined throughout the enactment between several domains and reflection as essential mechanisms for occurrence of teacher learning.

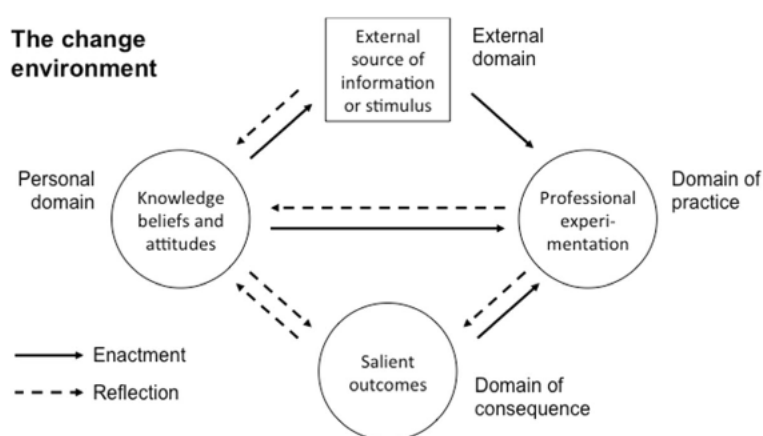


Figure 1: The interconnected model of teacher growth (Chan et al., 2018, 93)

The main research questions of the international collaborative project are:

To what classroom objects, actions and events do teachers attend and with what consequence for their learning?

How is teacher selective attention influenced by

- existing teacher knowledge and beliefs?
- the lesson's content and structure?
- contextual characteristics of school and classroom?

Do teachers in different countries/cultures attend to different classroom events and consequently derive different learning benefits from teaching a lesson?

Data collection and analysis

The international data collection involves both qualitative (video and audio material from lessons and interviews) as well as quantitative data (questionnaires). A codebook that allows for the consistent coding of the qualitative data from all three countries is currently being developed by the international research team. Two sub-studies are being carried out in order to address the research questions guiding the project:

Case studies with Grade 5, 6 and 7 teachers from Australia, China and Germany observing two teachers per Grade level and focusing on the interaction between the teacher and the lesson in sufficient detail seek to reveal the mechanisms connecting teacher attention to teacher learning. observing two teachers per grade level.

Online surveys in all three countries aim at recruiting at least 40 teachers per Grade level in each country seek to collect data about patterns in teacher attention and consequent learning in order to generate and test hypotheses.

Participating teachers in both sub-studies will teach lessons according to their modifications of lessons plans provided for specific topics and develop and teach a follow-up lesson as well as respond to questionnaires about their beliefs, their pedagogical and mathematical content knowledge drawn from the TEDS-M study.

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