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# Patterns of interaction in support situations in mathematics classrooms

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## Introduction

Teaching mathematics comes with various challenges considering that learners differ, inter alia, in their learning and performance abilities (Demo et al., 2021; Parsons et al., 2018). Concerning these individual differences, the teacher's task consists in supporting each student's learning to effectively promote their learning processes (Parsons et al., 2018). Nonetheless, a number of studies indicate that adaptive support takes place in only a few instances (Lotz, 2016). For this reason, the project focuses on support situations in mathematics classrooms of primary school. These specific situations are characterised by primarily dyadic teacher-student interactions which take place while learners work on their tasks in a lesson and support provided by the teacher.

When teaching is adjusted to the learners, it is referred to as an active or proactive response to heterogeneity depending on the extent of adaptation and individual support given (Weinert, 1997). Within an educational context, the term *adaptivity* may be delineated as the match between learning opportunities provided by the teacher and students' specific learning conditions (Brühwiler & Vogt, 2020; Hardy et al., 2019). The learners' respective educational needs are met by applying adaptive strategies, and thus their learning outcomes are positively affected (Brühwiler & Vogt, 2020). In order to provide adaptive support for every student, relevant information on their current learning level is required (Hardy et al., 2019). Hence, diagnostic competence is particularly necessary on the part of the teacher (ibid.). For this purpose, the interaction between learner and teacher plays a significant role: through interaction, it is possible to detect the student's stage of learning and make adjustments so that adaptive situations develop (Krammer, 2009). Consequently, individual learning support constitutes one form of adaptivity on the micro level of teaching (ibid.).

## Aim and methods

In general, there is little knowledge on how students are supported in primary school (Lotz, 2016). However, there are empirical results suggesting that teacher support is rarely adaptive (ibid.). Furthermore, the helping behaviour of teachers during phases of students' individual work has been hardly examined (Krammer, 2009). Therefore, adaptivity and its potential significance for subject-specific learning in the form of mathematical depth in support situations constitute the object of research. It is of considerable interest to find out how primary school students are supported while they are working on tasks in mathematics lessons and how far mathematical content is thereby deepened.

Since support situations have been insufficiently explored, those specific teacher-student interactions are going to be analysed. For this, videotaped maths lessons in primary school, which are provided by the DFG Graduate School INTERFACH functioning as a project framework, will be used. Not

only does working with this database enable gaining insights into given support in elementary school but also into the evolving mathematical subject, which is of great importance, as indicated above. As a first step, dyadic teacher-student interactions which take place while learners work on their tasks are going to be identified and described. By means of a designed coding system, the different types of support are going to be categorised. Characterising these situations in this way will be the subject of the poster while the main focus will lie on developing the coding system, which will also be depicted. Afterwards, the extracted sequences will be evaluated in regard to adaptive support. More precisely, it will be focused on whether the given support addresses the students' issues or concerns and if the children are encouraged as well as able to apply a deeper understanding for the learning content. To this end, these situations will be examined for professional contents, typical mathematical techniques as well as the teacher's orientation. These components form the basis for classifying mathematical depth in support situations.

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