Teachers' expectations and their relationship to achievement, self-concept, and anxiety in Mathematics among primary school students

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Biography

Lena Hollenstein is a senior researcher at the Institute of Research on Teaching Profession and on Development of Competencies as well as the Institute for Research into Teaching and Learning. Her research interests focus on teachers' expectations and teacher education, teachers' professional competence as well as teaching quality and student learning outcomes. Furthermore, her research interests are in early childhood, especially in digital education. She worked in the longitudinal study "Outcomes of teacher education" funded by Swiss National Science Foundation (SNSF). She holds a PhD in educational science from University of Cologne (Germany). Her doctoral thesis was on primary mathematics teachers' expectation and the relation with students' mathematics learning outcomes. At present, she works on gender-sensitive free play impulses for digital transformation in kindergarten (www.weplaythefuture.ch). Additionally, she works as project coordinator in an evaluation project on teacher education in Austria.

ABSTRACT

Teachers' expectations not only have a positive impact on students' achievement (e.g., Rubie-Davies et al., 2015), but also on students' motivational characteristics such as their self-concept (e.g., Friedrich et al., 2015; Hollenstein, 2020). Nevertheless, most studies focus on the impact on students' achievement, followed by studies on motivational characteristics (Wang et al., 2018). Motivational characteristics are a significant determinant of academic success and can include students' self-concept or emotions, such as anxiety (Brühwiler & Helmke, 2018). The extent to which anxiety can be influenced by teachers' expectations has hardly been investigated (e.g., Zhu & Urhahne, 2015). This paper therefore examines the following research question: how are teachers' expectations related to changes in students' achievement, self-concept, and anxiety in mathematics within a school year?

The data are from a longitudinal study "Outcomes of teacher education", funded by the Swiss National Science Foundation based on 28 teachers and 509 primary school students. Teachers' expectation was operationalised using the Madon et al. (1997) residual approach (see also Hinnant et al., 2009; Rubie-Davies & Peterson, 2016). The students' mathematics achievement was assessed via a standardised mathematics test (Moser, 2003) and their self-concept as well as their mathematics anxiety via a questionnaire (Ramm et al., 2006).

The multi-level structure is considered in the analyses, because the interclass-correlation of students' mathematics achievement exceeds the critical value of 10% (Lüdtke et al., 2009).

The results (random intercept models) showed that teacher expectations were positively related to achievement growth as well as self-concept change and negatively related to anxiety towards mathematics. The change in the explained variance was small (self-concept and anxiety) to large (achievement).

The results extend findings on the expectation effect in the classroom, as they focus not only on cognitive characteristics but also on motivational characteristics and are discussed regarding the significance for academic success.