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General pedagogical knowledge, self-efficacy and instructional practice: Disentangling their relationship in pre-service teacher education

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HIGHLIGHTS

- Pre-service teachers' GPK, SE, and reported instructional practice (IP) is examined.
- We hypothesize a positive relation between GPK, SE, and reported IP.
- Pre-service teachers' GPK and SE are not related.
- GPK significantly relates to some scales of IP (student support, providing structure).
- SE significantly and strongly relates to all scales of reported IP.

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ABSTRACT

Teachers' professional competence is composed of cognitive (professional knowledge) and affective (professional beliefs) components. These components are generally assumed to be related and to impact instructional practice. However, studies simultaneously relating cognitive and affective components to instructional practice are scarce. The present study investigates the relationship between general pedagogical knowledge (GPK), self-efficacy beliefs (SE), and reported instructional practice based on a sample of 342 pre-service teachers. No significant association was observed between GPK and SE. Furthermore, SE significantly predicted all investigated reported instructional practices, although GPK only predicted reported instructional practices that dealt with student support and provision of structure.

1. Introduction

It has been convincingly shown that teachers are main determinants of instructional practice and student learning outcomes (e.g., Darling-Hammond, 2000; Schleicher, 2016). Consequently, one of the important aims of teacher education in many countries worldwide is to develop pre-service teachers' professional competence (e.g., Cochran-Smith & Villegas, 2016; European Commission, 2013). Professional competence can be referred to as "what teachers actually need to act successfully during their professional life" (Blömeke, Felbrich, Müller, Kaiser, & Lehmann, 2008, p. 720). Current conceptualizations agree on the multidimensionality of professional competence, including cognitive (professional knowledge) and dynamic-affective (professional beliefs and motivational orientations) aspects (Baumert & Kunter, 2013; Blömeke, 2017). Following Shulman (1987), professional knowledge is considered to include content knowledge (knowledge of the subject matter to be taught), pedagogical content knowledge (knowledge about how to teach that particular subject matter, taking into account students' conceptions and learning difficulties), and general pedagogical knowledge (knowledge about learning and teaching that transcends subject matter). Different from professional knowledge, a common framework for understanding teachers' dynamic-affective aspect is lacking. However, based on different conceptualizations of teachers' professional beliefs (e.g., Baumert & Kunter, 2013; Blömeke et al., 2008; Olafson & Schraw, 2006; Pajares, 1992) one can at least distinguish the following

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components, each of them being both domain-specific and domain-general: epistemological beliefs (i.e., beliefs about the nature of knowledge and knowing), beliefs about learning and teaching, beliefs about the social context of learning and teaching, and self-efficacy beliefs (i.e., beliefs about one's capacities to teach). Several studies have revealed the importance of separate components of teachers' professional knowledge and beliefs in view of instructional behavior and student learning outcomes (e.g., Gitomer & Bell, 2016). However, to date, there have been only limited studies investigating the relation between professional knowledge and professional beliefs, and their link with instructional practice (Fives, 2003; Kunter et al., 2013). The present study will focus on two distinct aspects of pre-service teachers' professional competence, i.e. general pedagogical knowledge (GPK) and self-efficacy beliefs (SE), and their association with reported instructional practice. Although we do not deny the importance of other aspects of teachers' professional competence we focus on GPK and SE for at least two reasons. First, researchers have provided evidence that these aspects are important elements of teachers' professional competence and are associated with teachers' professional success and well-being (e.g., Klassen, Tze, Betts, & Gordon, 2011; Lauermann & König, 2016). Second, both aspects are domain-general allowing participation of pre-service teachers from different disciplines. Our research is situated in the German context, however, as the GPK and SE instruments we use have already been applied and validated for different educational contexts in other studies, a reference to a broader perspective of discussion is provided.

2. Theoretical framework

2.1. General pedagogical knowledge

Shulman (1987) was one of the first scholars to conceptualize teachers' professional knowledge base, including both domain-specific and domain-general categories. His category GPK referred to "those broad principles and strategies of classroom management and organizations that appear to transcend subject matter" (Shulman, 1987, p. 8). Later conceptualizations (e.g., Borko & Putnam, 1996; Dicke et al., 2015; König, Blömeke, Paine, Schmidt, & Hsieh, 2011; Voss, Kunter, & Baumert, 2011) extended Shulman's definition to also include knowledge regarding aspects of teaching methods, student motivation, student heterogeneity, and assessment. Only since the last decade, empirical tests have been developed to assess teachers' GPK (König et al., 2011; Voss et al., 2011). Based on a sample of 746 pre-service teachers Voss et al. (2011) found evidence for a four-factor structure (what they labelled as pedagogical/psychological knowledge) entailing knowledge of teaching methods, classroom management, classroom assessment, and student heterogeneity. In an international comparative study of 771 German, 607 US and 365 Taiwanese pre-service teachers, König et al. (2011) also revealed the multi-dimensional rather than mono-dimensional structure of GPK, with the four factors classroom structure, motivation and classroom management, student heterogeneity, and classroom assessment being stable across distinct samples of pre-service teachers. This finding was replicated with a sample of 573 pre-service teachers in Austria, further validating the test in different countries (König, Ligtvoet, Klemenz, & Rothland, 2017). In these studies, positive intercorrelations between the four factors were observed and, moreover, in the study by Voss et al. (2011) these intercorrelations were explained by a second-order factor GPK. Furthermore, Voss et al. (2011) showed that GPK of pre-service teachers of mathematics was more strongly correlated with their pedagogical content knowledge ($r = 0.42$) than with their content knowledge ($r = 0.24$), a finding that was replicated for a sample of pre-service teachers of English as a foreign language (König et al., 2016). The moderate strength of the correlations in these studies provided further evidence that GPK differs from pre-service teachers' domain-specific knowledge.

Studies with pre- and in-service teachers have revealed that several background variables are associated with GPK. More particularly, studies have revealed an impact of teaching experience, i.e., teachers in their induction phase had significantly higher GPK compared to pre-service teachers (König, 2013; Voss et al., 2011). Besides, also prior knowledge, assessed by former high school performance, was significantly associated with GPK. Pre-service teachers with higher performances at the end of high school had significantly higher GPK scores compared to their peers with lower performances in high school (König et al., 2016). Contradictory findings were observed for gender: Female Bachelor pre-service teachers outperformed male Bachelor pre-service teachers, whereas no effect of gender was observed for Master pre-service teachers and in-service teachers (König et al., 2016; König, Ligtvoet et al., 2017). Regarding other background variables that are often considered to impact distinct aspects of teachers' professional competence, such as age, SES, or teacher training type (e.g., König et al., 2016; Kleickmann et al., 2013) no empirical evidence was observed for an impact of these variables on pre-service teachers' GPK (König et al., 2016; König, Ligtvoet et al., 2017).

2.2. Self-efficacy

Teachers' SE relates to the degree of teachers' confidence in being successful to perform their teaching tasks (Fives, 2003; Pfitzner-Eden, Thiel, & Horsley, 2014). According to (Tschannen-Moran and Woolfolk Hoy (2001), p. 795) "to be useful and generalizable, measures of teacher efficacy need to tap teachers' assessments of their competence across the wide range of activities and tasks they are asked to perform". Accordingly, they developed a SE questionnaire —Teacher's Sense of Efficacy Scale (TSES)— that captured the multidimensional nature of teachers' instructional practices. Their data provided evidence for the existence of three factors: efficacy for student engagement, efficacy for instructional strategies, and efficacy for classroom management. Also other studies with in-service teachers from many different countries —e.g., US, Canada, Greece, Cyprus, Singapore, and Korea— were able to replicate this three-factor structure (Heneman, Kimball, & Milanowski, 2006; Klassen et al., 2008, 2009; Tsigilis, Koustelios, & Grammatikopoulos, 2010). However, some of the studies investigating only pre-service teachers (e.g., Berg & Smith, 2014; Duffin, French, & Patrick, 2012) questioned the underlying three-factor structure of TSES for participants with limited teaching experience as a one-factor model seemed to be a more appropriate model to describe pre-service teachers' SE. Moreover, TSES is criticized as it assessed "the degree of *influence* that preservice teachers believe they could exert over tasks relating to instructional strategies, classroom management and student engagement" instead of "the degree of *confidence* with which they believe they could successfully perform those tasks" (Pfitzner-Eden et al., 2014, p. 90). Therefore, Pfitzner-Eden et al. (2014) modified the original TSES to assess the confidence-level of teachers, while keeping the distinct dimensions of instructional practices identical to the original instrument. For instance, regarding the dimension student engagement, the original statement "How much can you do to help students value learning" was modified to "How certain are you that you can help students value learning". With their revised TSES they were able to confirm the three-factor structure (i.e., instructional strategies, classroom management, and student engagement) with three different samples of pre-service teachers from Germany and