Teacher Self-Efficacy

Rebecca Lazarides and Lisa Marie Warner

Subject: Cognition, Emotion, and Learning, Professional Learning and Development, Educational Administration and Leadership
Online Publication Date: May 2020 DOI: 10.1093/acrefore/9780190264093.013.890

Summary and Keywords

A teacher's belief in his or her own capability to prompt student engagement and learning, even when students are difficult or unmotivated, has been labeled "teacher self-efficacy" in the context of social learning and social cognitive theory developed by Albert Bandura. Research shows that teachers with high levels of self-efficacy are more open to new teaching methods, set themselves more challenging goals, exhibit a greater level of planning and organization, direct their efforts at solving problems, seek assistance, and adjust their teaching strategies when faced with difficulties. These efforts pay off for self-efficacious teachers themselves, who have been found to be affected by burnout less often and are more satisfied in their jobs but also for their students, who show more motivation, academic adjustment, and achievement. While self-efficacy of the individual teacher explains how the individual teacher's beliefs relate to students' academic development, collective teacher efficacy helps to understand the differential effect of faculty and whole schools on student outcomes. Consequently, systematically exploring effective techniques to increase teacher self-efficacy is highly relevant to the teaching context.

Previous research has suggested four sources related to the development of self-efficacy: mastery experience, vicarious experience, verbal persuasion, and somatic and affective states. Although there is ample evidence that teacher self-efficacy and collective self-efficacy are important for teacher and student outcomes, and some intervention programs for teachers in trainings, career teachers, and upon school factors show promising results, there is still a lack of longitudinal and experimental research on the independent effect of each of the four sources on teacher self-efficacy.

Keywords: teacher self-efficacy, collective teacher efficacy, measurement of self-efficacy, student outcomes, school context, sources of self-efficacy, interventions, social learning theory, social cognitive theory, teaching quality

Introduction

Perceived self-efficacy in general refers to "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). The concept of self-efficacy was first developed by Albert Bandura within his social

cognitive theory (Bandura, 1986), which postulates that human achievement depends on interactions between an individual's behavior, personal factors (e.g., beliefs), and environmental conditions.

Self-efficacy can be distinguished from *outcome expectations*, which refer to an individual's estimate that a given behavior will lead to certain outcomes (Bandura, 1977). Self-efficacy can also be distinguished from *self-concept*, which refers to an individual's perception of his or herself in general formed through experience with and interpretations of his/her environment (Shavelson, Hubner, & Stanton, 1976). Marsh et al. (2018) described self-efficacy as being future oriented (*prospective:* "What can I do?" according to Bandura 1997—or even more prospective "What am I able to come up with?") whereas self-concept is based on past accomplishments (*retrospective:* "What have I done/felt/thought"). Self-efficacy also encompasses expected accomplishments while self-concept is based on how accomplishments meet specific standards associated with various frames of reference (*frames of reference effects*). Thus, self-efficacy measures are descriptive, whereas self-concept responses are both descriptive and evaluative *(evaluative: "How am I as a person";*Marsh et al., 2018). Individuals high in self-efficacy would, for example, respond positively to an item such as, "Please rate how certain you are that you can solve the academic problems at each of the levels described below" (see problem-solving self-efficacy; Bandura, 2006).

Teacher self-efficacy is defined as a judgment of one's own capabilities to bring about desired outcomes of student engagement and learning, even when students are difficult or unmotivated (Tschannen-Moran & Woolfolk Hoy, 2001). Teachers with high self-efficacy are more open to new ideas and new teaching methods; they exhibit a greater level of planning and organization, are more constructive in dealing with mistakes of their students, and are more persistent in the face of difficulty (Tschannen-Moran, Hoy, & Hoy, 1998). Consequently, teacher self-efficacy is a theoretical construct that is very relevant in the teaching context, which is, in turn, shaped by teachers' personal characteristics (e.g., gender, teaching experience) but also by classroom characteristics (e.g., performance level) and school and principal characteristics (e.g., work experience of the principal) are highly relevant for teachers' self-efficacy (Fackler & Malmberg, 2016).

A distinction has to be made between *teacher self-efficacy* and *teaching efficacy* (Gibson & Dembo, 1984): Teacher self-efficacy reflects the degree to which teachers *evaluate their abilities* to bring about positive student change in face of unforeseen difficulties, while teachers' efficacy beliefs (outcome expectations) refer to teachers' *beliefs about the likely consequences* of performing specific tasks/behaviors at specific levels of competence (Tschannen-Moran & Woolfolk Hoy, 2001).

Another central feature of the concept of teacher self-efficacy in Bandura's view is its context specificity. Bandura conceptualized self-efficacy as task-, realm- or domain-specific, meaning that individuals can hold very different levels of self-efficacy beliefs for different behavioral domains (Bandura, 1997), such as classroom management, student engagement, or instructional practices (Tschannen-Moran & Woolfolk Hoy, 2001).

Bandura originally conceived self-efficacy expectations as an individual cognition. Later, he explicitly extended it to the level of beliefs of individuals about the self-efficacy of a collective (1993, 1997). *Collective efficacy* as defined by Bandura refers to beliefs of group members concerning the performance capability of a social system (Bandura, 1997; Goddard, Hoy, & Woolfolk Hoy, 2004). Research on teachers' collective efficacy beliefs emphasizes that teachers have not only self-efficacy beliefs that refer to themselves but also beliefs about the conjoint capability of a school faculty (Goddard et al., 2004). Perceived collective self-efficacy of teachers refers, for example, to the judgment of teachers in a school that the faculty as a whole can organize the courses of action required for effective teaching and successful academic development in students. Research on collective teacher self-efficacy thus helps to better understand teachers' beliefs about potential effects of faculty and whole schools on student achievement (Goddard, Hoy, & Hoy, 2000).

The aim of this article is to provide an introduction in current theoretical and empirical work on teacher self-efficacy. The chapter is divided into eight sections—in the first section we discuss the level of specificity and measurement of teacher self-efficacy beliefs. In the second section we introduce sources of teacher self-efficacy. The third section describes the psychological processes related to teacher self-efficacy. The fourth section summarizes the current state of research on consequences of teacher self-efficacy for teachers, teaching, and student development. The fifth section is concerned with the development of teacher self-efficacy during the teaching career. The sixth section discusses how teacher self-efficacy can be enhanced by interventions and by factors related to school context. The seventh section outlines future research areas in the field of teacher self-efficacy. The final section delineates take home messages.

Level of Specificity and Measurement of Teacher Self-Efficacy Beliefs

In this section, we first briefly introduce theoretical considerations about the level of specificity of teacher self-efficacy and second, based on these theoretical considerations, we describe existing measures on teacher self-efficacy.

Level of Specificity

According to Bandura (1986), self-efficacy measures are most predictive of behavioral outcomes when they are matched to a specific outcome and thus tailored to the domain of functioning and/or task under investigation. Accordingly, empirical research has shown that self-efficacy beliefs assessed specifically for a certain behavior predict specific behavioral outcomes best (Pajares, 1996). However, the trade-offs of highly specific measures are their often-limited practical relevance, whereas more general measures may promote practical relevance at the expense of precision and, possibly, construct validity (Lent & Hackett, 1987; Pajares, 1996). The theoretical discussion about the level of specificity of self-efficacy is strongly reflected in the work on teacher self-efficacy. Teacher self-efficacy is thereby described as both context- and subject-matter specific (Tschannen-

Moran & Woolfolk Hoy, 2001). The model of teacher self-efficacy by Tschannen-Moran et al. (1998), for example, suggests that a valid measure of teacher self-efficacy should assess teachers' perceived competence and an analysis of a specific teaching-related task including resources and constraints in the particular teaching context.

Measurement of Teacher Self-Efficacy Beliefs

The measurement of teacher self-efficacy is an important topic in recent research on teacher self-efficacy and the development of valid and ecologically valid measures are still an accentuated need in current research (Klassen, Tze, Betts, & Gordon, 2011). Because of the wide variety of measures assessing teacher self-efficacy, this chapter presents a short overview rather than the detailed review of existing measures that has been provided elsewhere (see for example Tschannen-Moran & Woolfolk-Hoy, 2001; Klassen et al., 2011).

In the 1970s, researchers related to the RAND organization developed a two-item questionnaire to assess teachers' beliefs in their ability to influence student achievement focusing on teachers' beliefs whether their control over their teaching success is internal or external. Other researchers expanded this scale and developed new measures—for example including personal and general teaching efficacy (Gibson & Dembo, 1984). However, the general teaching self-efficacy factor has been discussed critically in terms of its reliability and validity (see Klassen et al., 2011).

Another conceptual strand in the measurement of teacher self-efficacy was provided by Bandura (1990), which proposed a differentiation between teachers' self-efficacy beliefs (conviction that one can orchestrate the needed actions to perform a given task) and outcome expectations (estimating the likely consequences of performing that task at the expected level of competence). Bandura's (1990) Teacher Self-Efficacy Scale (TSE) has been the basis for recent teacher self-efficacy scales and refers to different domains of teachers' activities in schools: (1) self-efficacy to influence decision making (e.g., "How much can you express your views freely on important school matters?"); (2) self-efficacy to influence school resources (e.g., "How much can you do to get the instructional materials and equipment you need?"); (3) instructional self-efficacy (e.g., "How much can you do to get through to the most difficult students?"); (4) disciplinary self-efficacy (e.g., "How much can you do to control disruptive behavior in the classroom?"); (5) self-efficacy to enlist parental involvement (e.g., "How much can you do to get parents to become involved in school activities?"); (6) self-efficacy to enlist community involvement (e.g., "How much can you do to get local colleges and universities involved in working with the school?"); and (7) self-efficacy to create a positive school climate (e.g., "How much can you do to make students enjoy coming to school?"). The TSE Scale has gained acceptance by researchers due to its psychometric and conceptual superiority to the Gibson and Dembo (1984) scale (Morris, Usher, & Chen, 2017). However, referring to the idea that self-efficacy measures are most predictive of behavioral outcomes when they are matched to a specific outcome, other new and more specific measures based on the TSE Scale have been developed. Tschannen-Moran and Woolfolk Hoy (2001), for example, introduced a new

measure of teacher self-efficacy based on Bandura's measure—the Ohio State Teacher Efficacy Scale (OSTES), also referred to as Teacher Sense of Efficacy Scales (TSES)—that differentiates three subdimensions of teacher self-efficacy: (1) efficacy for instructional strategies (e.g., "How well can you implement alternative teaching strategies in your classroom?"); (2) efficacy for classroom management (e.g., "How much can you do to calm a student who is disruptive or noisy?"); (3) efficacy for student engagement (e.g., "How much can you do to get students to believe they can do well in school work?").

Building on this research, other measures of teacher self-efficacy that have recently been developed put a stronger focus on the context under which self-efficacy beliefs about teaching are formed (i.e., in working classrooms). For example, the Teacher Efficacy Beliefs System-Self (TEBS-Self) Scale was designed to assess teachers' self-efficacy beliefs about tasks that are associated with effective teaching and learning within the context of their own classrooms (Dellinger, Bobbett, Olivier, & Ellett, 2008). The scale comprises subscales that refer to (1) classroom management (e.g., "Right now in my present teaching situation, the strength of my personal beliefs in my capabilities to …" "… effectively manage routines and procedures for learning tasks…"); (2) communication/clarification (e.g., "…communicate to students the purpose and/or importance of learning tasks…"); (3) accommodating individual differences (e.g., "…plan activities that accommodate the range of individual differences among my students…"); (4) motivation of students (e.g., "…motivate students to perform to their fullest potential…"); (5) managing learning routines (e.g., "…give directions for learning routines…"); and (6) higher order thinking skills (e.g., "…actively involve students in critical analysis and/or problem solving…"); with a response format range from "(1) Weak beliefs in my capabilities to "(4) Very strong beliefs in my capabilities."

Another newly developed measure, the Teachers' Self-Efficacy for Student-Oriented Teaching (SE-SOT) Scale, draws on teaching strategies targeting student motivation and engagement (e.g., "I am __% certain that I can…", "…present content that students relate to other subjects," "…provide a rationale to make academic tasks relevant") using confidence response scores ranging from 10% to 100% for each task (Kilday, Lenser, & Miller, 2016).

The measurement of teachers' collective self-efficacy has been discussed previously—established measures are, for example, the Collective Teacher Efficacy (CTE) scale, which consists of items that include a group orientation rather than an individual orientation (e.g., "Teachers in this school have what it takes to get the children to learn"; Goddard et al., 2000).

We limited our overview to measures referring to specific tasks in the teaching domain without reviewing the great variety of developed scales. However, other measures have been developed that refer to a broader set of school- and classroom related behaviors (e.g., Brouwers & Tomic, 2001: teacher interpersonal self-efficacy; Friedman & Kass, 2002: teacher self-efficacy in the classroom and in the school-organizational domain). Similarities in the proposed measures refer to their joint understanding of teacher self-ef-

ficacy as teachers' judgments of their own capabilities to bring about desired outcomes of teaching and learning in the classroom and school context. It is also important to note that the introduced measures differ in their level of specificity. Knowledge about the measurement of teacher self-efficacy is important not only for educational research but also for school faculty. For example, knowing that self-efficacy is malleable, context-specific, and situational may help to understand that own competence beliefs are shaped by different teaching settings and groups of students.

Sources of Teacher Self-Efficacy

In a social learning analysis, Bandura (1977) described that self-efficacy is based on four major sources of information: mastery experiences, vicarious experience, verbal persuasion, and somatic and affective states. The four sources of self-efficacy do not affect self-efficacy directly, their effects depend on how a person interprets the experiences (Bandura, 1997). Teacher self-efficacy also relies on these four sources of information (Tschannen-Moran et al., 1998), although methodological shortcomings in the literature—for example, a lack of empirical evidence of the independent effect of each of the four sources, have prevented a clear understanding of the relations between the four sources and teacher self-efficacy (Morris, Usher, & Chen, 2017). The following subsections provide a detailed overview on the four sources of self-efficacy—first, the meaning of mastery experiences is explained; secondly, the role of vicarious experiences for the development of self-efficacy is described; thirdly, relations between verbal persuasion and self-efficacy are elaborated on; and lastly, somatic and affective states are discussed in terms of how they shape self-efficacy beliefs.

Mastery Experiences

Mastery experiences, also referred to as *enactive mastery experiences* or *performance accomplishments*, involve the achievement of goals through direct, personal action within the behavioral domain (Morris et al., 2017). Mastery experiences are considered the strongest source of creating perseverant self-efficacy expectations (Bandura, 1997). Successes in the behavioral domain enforce self-efficacy, and failures weaken it. However, according to social cognitive theory (Bandura, 1986), once strong self-efficacy beliefs have been built, failures have a less damaging effect on self-efficacy. The extent to which mastery experiences enhance an individual's self-efficacy depends on various factors such as preconceptions of one's own abilities, perceived difficulty of the task, the amount of effort invested and external support received, temporal patterns of success and failure, and the cognitive organization of these factors (Bandura, 1997). Mastery experiences thereby need to be attributed to one's own effort, skills, or abilities to foster self-efficacy. Consequently, success should be attributed to one's own efforts and abilities in order to increase self-efficacy. Although teachers who already spent many years in their profession and thus have a high level of mastery experience show higher self-efficacy beliefs than novice teachers (Klassen & Chiu, 2010), new challenges (i.e., new grade, new setting,

new curriculum) can always lead to a reevaluation of teaching skills and thus, to changes in self-efficacy beliefs (Tschannen-Moran et al., 1998).

Mastery experiences are not only important at the level of the individual but are also highly relevant at the level of organizations. Past school successes that teachers experienced as a group, for example, build their beliefs in the capability of the faculty, indicating that collective self-efficacy perceptions are strongly informed by mastery experiences (Goddard et al., 2004). An important question is whether mastery experiences alone can enhance teacher self-efficacy. Empirical studies showed that professional development formats that include mastery experience combined with verbal persuasion and feedback lead to increased levels of teacher self-efficacy (Morris & Usher, 2011; Tschannen-Moran & McMaster, 2009).

Vicarious Experiences

If a situation is novel and challenging, there may not have been an opportunity to create mastery experiences previously. In such cases, teachers rely on the observation of (and comparison with) similar others. Seeing others perform activities with positive consequences can help to raise expectations in observers that their own task accomplishment is possible as well (Bandura, 1977). Vicarious experiences refer to the observation of a social model accomplishing a task, triggering social comparison processes. However, self-modeling, in which a person *observes* his or her own task accomplishment, may also enhance personal self-efficacy beliefs (Bandura, 1997). It is important thereby to differentiate between vicarious experiences that refer to observations of (own) behaviors (e.g., observing own teaching behavior in class using classroom videography) and mastery experiences that refer to one's own direct and enactive experiences in a classroom situation rather than the observation of own behavior. *Coping models* that demonstrate fears and deficiencies to observers, but improve their performance, enhance self-efficacy more strongly among those individuals who experience self-doubt themselves than *mastery models*, who demonstrate faultless performance (Schunk, 1987).

There are many open questions regarding teacher self-efficacy and vicarious experiences—for example, it needs to be investigated how and under which circumstances teachers process and internalize vicarious experiences and what characteristics of models best facilitate vicarious self-efficacy growth (Henson, 2001). For example, research needs to examine whether observing expert teachers in classroom situations versus observing their own behavior in classroom situations yields different effects on teacher students' self-efficacy (Gold, Hellermann, & Holodinsky, 2017). Despite these open questions, vicarious experiences are seen as an important source of self-efficacy not only for the individual teacher but also for schools as organizations that may learn by replicating other institutions' successful educational programs (Goddard et al., 2004; Morris et al., 2017).

Verbal Persuasion

The third method of acquiring self-efficacy is by being told that one is able to tackle a certain problem. Verbal persuasion alone has limited effects on increases in teacher self-efficacy, but it can help individuals to mobilize greater effort when difficulties arise, and thus it can ameliorate the negative effects of self-doubt (Bandura, 1997). Consequently, if a teacher with low confidence in his/her competence is told that he/she has rich potential, such encouragement might help to invest the effort needed to accomplish the task successfully. However, self-efficacy beliefs built solely upon verbal persuasion will only sustain someone for a short time if subsequent efforts are unsuccessful. Therefore, it would be optimal if a competent teacher supervises a less experienced teacher in the sense of coaching through mastery experiences in challenging situations. Verbal persuasion in the context of teacher self-efficacy thereby refers to encouragement or specific performance feedback from a supervisor or a colleague or to discussions in the teachers' lounge about the ability of teachers to influence students (Goddard et al., 2004). Research on teacher self-efficacy beliefs, however, has suggested a lack of verbal persuasion as a predictor of self-efficacy among career teachers indicating that with the accumulation of mastery experiences, verbal persuasion comes to play a less significant role for teachers' self-efficacy beliefs (Tschannen-Moran & Woolfolk Hoy, 2007).

At the level of teachers' collective self-efficacy, verbal persuasion alone may not initiate changes at the group level, but when coupled with models of success and positive experiences, it can influence the collective self-efficacy beliefs of a faculty (Goddard et al., 2004). For example, when innovations or new policies are adapted in the school context, such as the inclusion of students with special educational needs, teachers' collective self-efficacy may be enhanced by external encouragement, for example, by emphasizing past achievements of the school in adapting to institutional changes, and by positive experiences with special need students in class.

Somatic and Affective States

Finally, somatic and affective states are the weakest source of information for self-efficacy. High somatic and affective symptoms of excitement or anxiety (e.g., nausea, sweating, dizziness) can be interpreted as an indication of one's own lack of competence. Consequently, emotional arousal before or during task involvement can weaken self-efficacy beliefs (Henson, 2001). To raise teacher self-efficacy beliefs, it is therefore useful to reduce stress levels and negative emotional arousal and to explain that feelings of physiological activation and emotional reactions should not be attributed to vulnerability or incompetence (Bandura, 1997).

At the level of collective teacher self-efficacy, it might be assumed that groups of teachers and organizations with strong beliefs in group capability can tolerate pressure and crises and continue to function without negative consequences as challenges are interpreted as manageable. Consequently, it might be expected that affective states also shape group-level processes—for example when teachers feel unprepared and overwhelmed by certain

new policies that need to be implemented in their school this might influence their beliefs about how the school and colleagues are able to deal with these new challenges. However, more research is needed to understand whether all sources of self-efficacy beliefs (e.g., affective states) are relevant at the group level (Goddard et al., 2004).

Psychological Processes Related to Teacher Self-Efficacy

In their integrated model of teacher self-efficacy, Tschannen-Moran et al. (1998) described the importance of cognitive processing in the formation of teacher self-efficacy. There are two cognitive processes that contribute to the development and emergence of teacher self-efficacy: (1) the *analysis of the teaching task and its context*, and (2) the *assessment of personal teaching competence*. The first process refers to teachers' analysis of the task and its context including the factors that make teaching difficult and a consideration of these constraints against the available resources. The second process refers to teachers' assessment of their competencies in relation to their shortcomings related to the task. The interaction of task analysis and assessment of own competence then affects self-efficacy. Teachers' self-efficacy beliefs, in turn, have a positive effect on performance. However, teacher self-efficacy has a *cyclical nature*—once a task has been accomplished successfully, this satisfactory performance is interpreted as a new mastery experience that will inform self-efficacy beliefs (Tschannen-Moran et al., 1998). Teacher self-efficacy not only affects performance but also seems to mediate the effect of social influences on adaptive self-regulatory functioning (Schunk & Zimmerman, 1997): High self-efficacy enhances regulative function indicating that when faced with academic stressors, teachers with high self-efficacy direct their efforts at resolving problems (Bandura, 1997). The influence of self-efficacy on performance and behavior can be explained by cognitive processes as well as by processes related to *goal setting*. Performance on tasks is influenced by the nature of personal goals that individuals strive to attain—high self-efficacy beliefs enable teachers to strive for challenging task goals, which, in turn, together with received feedback on their progress, lead to high task performances (Cervone, Mor, Orom, Shadel, & Scott, 2004). Task goals that are specific, short-term, and viewed as challenging but attainable enhance self-efficacy better than goals that are general, long-term, or not viewed as attainable (Schunk, 1995). Teachers who feel efficacious about teaching thus strive for challenging goals, but they are also inclined to implement effective self-regulatory strategies even when facing problems to reach their goals. Such strategies might be, for example, concentrating on the teaching task, using effective teaching methods, managing classroom time effectively, seeking assistance, and adjusting teaching strategies when needed. Thus, teachers' self-efficacy enhances processes of effective goal setting and self-management for goal striving—which are referred to as *volitional processes* (Schunk & Zimmerman, 1997). Teacher self-efficacy thereby seems to be particularly important in early phases of *behaviour change*—for example, when teachers aim to implement a specific teaching strategy for the first time, self-efficacy is helpful in dealing with the challenges of the new situation and helps sustain the new behaviors,

while the predictive value of self-efficacy decreases when it comes to the question of whether teachers maintain established behaviors (Rothmann, Baldwin, Hertel, & Fuglestad, 2011).

Teacher Self-Efficacy: Effects on Teachers, Teaching, and Students

The next section is divided into three subsections—first, we focus on the role of teacher self-efficacy for teachers' development, including well-being and emotional exhaustion; second, we describe current empirical research on the relations between teacher self-efficacy and teaching quality; and third, we delineate the consequences of teacher self-efficacy for students' academic development.

Teacher Self-Efficacy and Teachers' Development

Many studies have documented that teachers' self-efficacy negatively relates to teacher burnout (i.e., Fernet, Guay, Senécal, & Austin, 2012; Skaalvik & Skaalvik, 2007; Skaalvik & Skaalvik, 2010), and positively relates to job satisfaction (Caprara, Barbaranelli, Steca, & Malone, 2006; Collie, Shapka, & Perry, 2012). In their meta-analytic review, Zee and Koomen (2016) concluded that irrespective of school context (pre- or inservice), grade level, and country, self-efficacious teachers suffer less from stress and overall burnout, and they experience higher levels of personal accomplishment and job satisfaction. The mechanisms that underlie such relations have also been investigated, indicating, for example, that teachers with low self-efficacy are more vulnerable to the experience of job stress, leading to subsequent burnout (Schwarzer & Hallum, 2008).

Teacher Self-Efficacy and Teaching

Teacher self-efficacy is highly relevant for effective teaching behaviors in class despite moderate effect sizes for these relations (Klassen & Tze, 2014; Zee & Koomen, 2016). Teachers with high self-efficacy beliefs, for example, perceive school as a community in which students learn through cooperative experience (Woolfolk, Rosoff, & Hoy, 1990), and focus on learning and mastery rather than on competition in class (Lazarides, Buchholz, & Rubach, 2018). However, a considerable number of studies have not been able to show substantial relations between teacher self-efficacy and instructional practice, for example, for emotional support (i.e., Guo, Piasta, Justice, & Kaderavek, 2010; Lazarides, Fauth, Gaspard, & Göllner, 2019; Pakarinen et al., 2010), or teacher-student relationship (De Jong et al., 2014; Yoon, 2002). Longitudinal research also did not confirm that teacher self-efficacy is substantially related to student-perceived classroom management (Holzberger, Philipp, & Kunter, 2013; Praetorius et al., 2017), or to the degree of cognitive challenge and activation offered to students in instruction (Holzberger et al., 2013). Explanations for these mixed findings could include different career stages sampled, the measurement of teacher self-efficacy that often refers to general rather than specific task-related measures, a lack of longitudinal studies and a focus on different student

groups or different grades (Zee & Koomen, 2016).Taken together, the investigation of the role that teacher self-efficacy plays for student- and teacher-perceived instructional behaviors and the examination of the psychological mechanisms that underlie such relations are important challenges for future research which should be addressed using longitudinal designs that involve multiple perspectives including teachers, students and external observers.

Teacher Self-Efficacy and Student Academic Outcomes

Similarly to results on teaching behaviours, studies that have examined the links between teachers' self-efficacy and student outcomes come to rather modest results (Klassen, Tze, Betts, & Gordon, 2011). In their meta-analytic overview, Zee and Koomen (2016) concluded that teacher self-efficacy is modestly associated with students' academic adjustment and achievement, but closely linked to student motivation. The authors suggest that students' motivation may be more closely related to the quality of classroom processes, and consequently, may be a more proximal factor to teacher self-efficacy than academic performance. However, some studies suggest that in earlier age groups, teacher self-efficacy plays an important role for student achievement: Guo, Connor, Yang, Roehrig, and Morrison (2012), for example, found substantial effects of teacher self-efficacy on the development of children's literacy skills and showed that these effects were partially explained by teachers' supportive behaviours in class. Research on collective teacher self-efficacy further shows a comparably strong association between collective teacher self-efficacy and student achievement at the school level (Goddard et al., 2000; Tschannen-Moran & Barr, 2004). Taken together, the effects of teacher self-efficacy on student academic outcomes might be explained by teaching-related factors and might be different for self-efficacy beliefs of the individual teacher about his or her own capabilities and for beliefs about the capability of the teacher collective.

Development of Teacher Self-Efficacy During Teaching Career

Bandura (1977, 1997) described that teacher self-efficacy would be most malleable early in teacher training and that teacher self-efficacy tends to become fairly stable once established. Research on the development of teacher self-efficacy in different stages of teachers' careers shows that teacher self-efficacy tends to increase during teacher education and to decline after teachers enter the teaching profession (Woolfolk Hoy & Spero, 2005). This development has been explained by a "reality shock" of early career teachers when facing the challenges of teaching in a complex school setting (Tschannen-Moran et al., 1998). However, teacher self-efficacy seems to increase from early into mid-career. Studies showed that teacher self-efficacy for classroom management (Brouwers & Tomic, 2000; Klassen & Chiu, 2010; Wolters & Daugherty, 2007), and general teacher self-efficacy (Freeman, O'Malley, & Eveleigh, 2014) are higher for more experienced teachers than for novices. Klassen and Chiu (2010) showed a nonlinear relation between teachers' years

of experience and self-efficacy for classroom management, for instruction and for student engagement, indicating that each of the three self-efficacy dimensions increased from early career to mid-career (about 23 years of experience) and declined afterward. A possible explanation for such developmental trends might be related to the sources of self-efficacy: Tschannen-Moran and Woolfolk Hoy (2007) found that mastery experiences operationalized as the level of satisfaction with one's own professional performance were positively associated with both career and novice teachers' self-efficacy. Their findings thus implicate that increasing experiences in teaching and related satisfaction with own accomplishments might lead to higher self-efficacy in mid-career compared to early career teachers. The decrease in teachers' self-efficacy in later career stages might be explained with a higher tendency of disengagement or serenity, which has been described in the context of a professional life cycle of teachers (Huberman, 1989). However, it is important to note that mastery experiences were assessed very specifically in this study as they originally refer to the achievement of goals through direct, personal action, also considering the level of demandingness related to the goals (Bandura, 1997; Morris et al., 2017) and thus may go beyond satisfaction with achieved goals. Furthermore, it is important to note that most studies refer to Western societies and educational systems by focusing on teachers in Australia (Freeman, O'Malley, & Eveleigh, 2014), Canada (Klassen & Chiu, 2010), Europe (Brouwers & Tomic, 2000), and the United States (Tschannen-Moran & Woolfolk Hoy, 2007; Wolters & Daugherty, 2007). There is a clear need for research on the development of teacher self-efficacy in different cultural and school contexts.

Enhancing Teacher Self-Efficacy

In this section, we discuss the role that interventions play in enhancing teachers' self-efficacy beliefs. Subsequently, we provide an overview of school-related contextual factors that affect teacher self-efficacy beliefs.

Interventions on Individuals

There is reliable empirical evidence for the positive effects of interventions that implement means of social support on the maintenance and enhancement of teachers' self-efficacy and its sources (Warner & French, 2019). For example, positive findings were shown for an intervention that dealt with the use of the peer-coaching technique led by social educators (O'Connor & Korr, 1996): While the control group (teaching without intervention) showed a decrease in self-efficacy, teachers in the experimental group remained at their previous level. The principle of peer coaching was implemented as mutual observation of lessons followed by feedback and the opportunity for discussion. Ross and Bruce (2007) also focused on social support through coaching and tested a group coaching approach with sixth-grade teachers from Canadian schools explicitly targeting all sources of self-efficacy. *Mastery experiences* were, for example, enhanced by active teacher learning, and opportunities for reflection. *Vicarious experiences* were prompted, for example, by meeting experienced teachers who demonstrated new practices and by providing evidence that standard-based teaching implemented by teachers leads to higher student

achievement. *Social persuasion* was implemented by frequent assurances that participants would be successful for those participants who were unexperienced in standard-based teaching. *Physiological and affective states* were addressed by introducing new teaching ideas that were less threatening to more threatening. In their study, the self-efficacy of classroom management was indeed enhanced through these coaching methods (Ross & Bruce, 2007).

Focusing on the school-level, Kelm and McIntosh (2012) showed that the program "School-Wide Positive Behavior Support (SWPBS)" increased general teacher self-efficacy beliefs when investigating Canadian schools that implemented the program compared to schools without implementation. The "SWPBS" (Sugai & Horner, 2009) promotes a positive school environment by letting the school personnel select and implement interventions that are feasible and relevant to the setting of their respective school and that have been empirically shown to successfully reach their goals. Self-efficacy can already be enhanced by interventions during teacher education. Çelebi, Krahé, and Spörer (2014) showed positive effects of the intervention program "strengthened for the teaching profession" in their quasi-experimental study with German teacher students. As part of the intervention, teacher students participated in a three-day intensive training in which they worked on five topics including (1) health and life satisfaction; (2) personal strengths and weaknesses; (3) health, self-regulation, and exhaustion; (4) professional competences; and (5) competence development. During this phase, students were asked to identify personal strengths and weaknesses, to develop a profile of their own professional competences and milestones for personal development based on their individual profile. The second phase consisted of an eight-week period of working on strengths, weaknesses or both. During this phase, three treatment conditions existed focusing (1) on teacher students' individual professional strengths—teacher students were asked to use their strengths in a goal-oriented manner, (2) professional weaknesses—teacher students were asked to work on two weaknesses, or (3) a combination of strengths and weaknesses in which teacher students focused on one of their strengths and worked on one of their weaknesses. After participation in the intervention conditions, teacher students in the three intervention conditions scored higher on measures of self-efficacy than teacher students in the control group. In addition, the combined intervention was more successful at enhancing teacher students' self-efficacy than the intervention focusing either on strengths or relative weaknesses, only. Possible mechanisms that might explain these results are that self-efficacy does not increase when students are only confronted with their own weaknesses because mastery experiences are not triggered during this process (group 2) whereas students who are confronted only with their strengths (group 1) might in turn not experience that they are able to deal with tasks that are difficult and challenging. Students who focus on both strengths and weaknesses (group 3) might experience mastery experiences by focusing on their strengths *and* at the same time feel that they are able to work on challenging tasks in a successful way, which could be an explanation for higher levels of self-efficacy in this intervention group.

School Context

Not only direct interventions but also the school context matters when aiming to enhance teacher self-efficacy beliefs (Lazarides, Watt, & Richardson, 2019). Several studies have indicated that factors related to the school environment are highly important to teacher self-efficacy (Fackler & Malmberg, 2016; Hoy & Woolfolk, 1993; Meristo & Eisenschmidt, 2014). Focusing on *school size* and *school types*, Meristo and Eisenschmidt (2014), for example, found that novice teachers in kindergarten or elementary schools had higher self-efficacy beliefs than novice teachers in comprehensive schools or at vocational schools. These differences were most pronounced for self-efficacy in student engagement. Additionally, teachers working at small schools with fewer than 100 students had the highest level of self-efficacy, whereas teachers working at schools with more than 500 students reported the lowest level of self-efficacy. Using data from the Teaching and Learning International Survey (TALIS), an OECD-driven international school and teacher survey, Fackler and Malmberg (2016) found that *principal's work experience* and an *instructional leadership* style (i.e., promoting instructional improvement, professional development, and supervision of instruction) were associated with teacher self-efficacy. The authors suggest that these factors reflect vicarious experience (principal as a role model) and verbal persuasion (feedback culture) that enhance teacher self-efficacy. Similarly, Pas, Bradshaw, and Hershfeldt (2012) found that teachers' perceptions of *collegial leadership* and a good climate among the school staff (*teacher affiliation*) were significantly associated with current teacher self-efficacy and developments of teaching self-efficacy for elementary school teachers. However, school-level indicators of disorder (i.e., mobility, enrollment, and percentage of students suspended in the school) had no effect on teacher self-efficacy in their study. Accordingly, Stipek (2012) showed that teachers' *perceptions of the support they received from administrators and parents* were positively associated with their self-efficacy. Social support can thereby be seen as a source of self-efficacy in terms of social persuasion through positive performance feedback and through modeling behaviors—for example by providing positive examples of effective teaching behaviors in challenging classroom situations.

Another way to enhance teacher self-efficacy at the school level is mentoring (Schleicher, 2018). In particular, *constructivist mentoring* seems to improve teacher self-efficacy, as well as teachers' enthusiasm and job satisfaction (Richter et al., 2013). Constructivist beliefs thereby refer to teachers' beliefs that learning is an individual process that depends on students' prior knowledge and characteristics of the environment. In their study on German elementary school classroom teachers, Staub and Stern (2002) showed that teachers who held constructivist beliefs more frequently presented tasks that required conceptual understanding instead of factual knowledge. Consequently, a potential underlying mechanism that explains the positive relation between constructivistic mentoring and teacher self-efficacy might be that mentoring that focuses on individual learning might enhance teachers' conceptual understanding, which could be interpreted as a mastery experience.

Future Research Areas

The preceding literature review showed that teacher self-efficacy is an important predictor of teacher well-being, effective teaching, students' academic adjustment and achievement as well as student motivation. However, previous research has identified a lack of studies that focus on the assessment of sources of self-efficacy (Morris et al., 2017) and their role in enhancing teacher self-efficacy in school. Experimental research testing prompts for different sources of teacher self-efficacy ideally in factorial study designs (testing each source alone and combinations) is highly recommended.

Reviews have further identified a deficiency of longitudinal studies when examining effects of teacher self-efficacy on teaching behaviors (Zee & Koomen, 2016). More research is needed that investigates the directionality of relations between teacher self-efficacy and teaching behaviors over time as this would allow to better understand whether self-efficacy affects subsequent teaching behaviors or whether previous teaching experiences shape subsequent teacher self-efficacy. Furthermore, when investigating the effects of teacher self-efficacy on burnout, more and consistent research on the psychological and behavioral processes is needed that explains effects of teacher self-efficacy on burnout. Previous research has suggested, for example, that generally low-efficacious teachers who believe that they are able to manage classroom disturbances are more successful in managing disturbances in class and subsequently report lower emotional exhaustion (Dicke, Parker, Marsh, Kunter, Schmeck, & Leutner, 2014). As Bandura (1997) pointed out, self-efficacy has a cyclical nature—teacher self-efficacy enhances performance, but prior performance, which serves as a mastery experience, also informs subsequent self-efficacy. However, recent studies show that mastery enhances self-efficacy but that self-efficacy is less relevant for future achievement-related behaviors (Talsma, Schüz, Schwarzer, & Norris, 2018; Sitzmann & Yeo, 2013). Only few studies, examine such reciprocal effects, but the little existing empirical evidence suggests the existence of the theoretically proposed cyclical nature of teacher self-efficacy. In their longitudinal study, Holzberger et al. (2013), for example, showed that teacher-reported self-efficacy was positively affected by prior students' experience of cognitive activation and teachers' ratings of classroom management whereas teacher self-efficacy only predicted teacher-reported learning support. More longitudinal research is needed to examine such bidirectional links between teacher self-efficacy and teaching behaviors.

Take Home Messages

This chapter aimed to provide an overview about theory and research on teacher self-efficacy. Taken together, research proposes that efficacious teachers more effectively handle difficult teaching situations because they set themselves more challenging goals, exhibit a greater level of planning and organization, direct their efforts at solving problems, seek assistance, and adjust their teaching strategies when faced with difficulties (Bandura, 1997; Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998). Through its effects on goal setting and effort, highly efficacious teachers are able to teach effectively in difficult classroom

situations and, through this process, perceive lower levels of emotional exhaustion, higher job satisfaction, and enable their students to attain higher levels of academic adjustment (Tschannen-Moran et al., 1998; Zee & Koomen, 2016). These processes have been tested mostly in correlational work, and more longitudinal and experimental studies are needed to examine the underlying theoretical assumptions. For example, more research is needed to test the *cyclical nature* of teacher self-efficacy indicating that satisfactory performances are interpreted as mastery experiences which inform self-efficacy beliefs in turn (Tschannen-Moran et al., 1998). When investigating the implications of teacher self-efficacy beliefs, it is important to note that teacher self-efficacy is task-, realm- or domain-specific, indicating that teachers can hold very different self-efficacy beliefs in different behavioral domains—for example, a teacher can feel highly efficacious in classroom management but perceive only low levels of self-efficacy in engaging students for learning. Lastly, teachers' self-efficacy beliefs are malleable and can be enhanced in educational interventions and through provision of external support in the school context (Çelebi, Krahé, & Spörer, 2014; Richter et al., 2013; Warner & French, 2019).

Acknowledgments

This theoretical work has been supported by the German Research Foundation from 2019–2021 under grant number LA 3522/5-1 and by the German Ministry of Education and Research within the programme scheme „Qualitätsoffensive Lehrerbildung“ under grant number 01JA1516 to Rebecca Lazarides.

Further Reading

Bandura, A. (1997). ***Self-efficacy: The exercise of control***. New York, NY: Freeman.

Goddard, R. D., Hoy, W. K., & Hoy, A. W. (2004). **Collective efficacy beliefs: Theoretical developments, empirical evidence, and future directions**. *Educational Researcher*, *33*(3), 3–13.

Klassen, R. M., & Tze, V. M. (2014). **Teachers' self-efficacy, personality, and teaching effectiveness: A meta-analysis**. *Educational Research Review*, *12*, 59–76.

Morris, D. B., Usher, E. L., & Chen, J. A. (2017). **Reconceptualizing the sources of teaching self-efficacy: A critical review of emerging literature**. *Educational Psychology Review*, *29*(4), 795–833.

Tschannen-Moran, M., & Woolfolk Hoy, A. (2001). **Teacher efficacy: Capturing an elusive construct**. *Teaching and Teacher Education*, *17*(7), 783–805.

Zee, M., & Koomen, H. M. (2016). **Teacher self-efficacy and its effects on classroom processes, student academic adjustment, and teacher well-being: A synthesis of 40 years of research**. *Review of Educational Research*, *86*(4), 981–1015.

References

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological review*, *84*(2), 191.

Bandura, A. (1986). *Social foundations of thought and action*. Englewood Cliffs, NJ: Prentice Hall.

Bandura, A., & National Institute of Mental Health. (1986). *Prentice-Hall series in social learning theory. Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (1990). *Multidimensional scales of perceived academic efficacy*. Stanford, CA: Stanford University Press.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: Freeman.

Bandura, A. (2006). Guide for constructing self-efficacy scales. In T. Urdan & F. Pajares (Eds.), *Self-efficacy beliefs of adolescents* (Vol. 5, pp. 307–337). Greenwich, CT: Information Age Publishing.

Brouwers, A., & Tomic, W. (2000). A longitudinal study of teacher burnout and perceived self-efficacy in classroom management. *Teaching and Teacher Education*, *16*(2), 239–253.

Brouwers, A., & Tomic, W. (2001). The factorial validity of scores on the teacher interpersonal self-efficacy scale. *Educational and Psychological Measurement*, 61(3), 433-445.

Caprara, G. V., Barbaranelli, C., Borgogni, L., & Steca, P. (2003). Efficacy beliefs as determinants of teachers' job satisfaction. *Journal of Educational Psychology*, *95*(4), 821–832.

Caprara, G. V., Barbaranelli, C., Steca, P., & Malone, P. S. (2006). Teachers’ self-efficacy beliefs as determinants of job satisfaction and students' academic achievement: A study at the school level. *Journal of School Psychology*, *44*(6), 473–490.

Çelebi, C., Krahé, B., & Spörer, N. (2014). Gestärkt in den Lehrerberuf: Eine Förderung berufsbezogener Kompetenzen von Lehramtsstudierenden. *Zeitschrift für Pädagogische Psychologie*, *28*, 115–126.

Cervone, D., Mor, N., Orom, H., Shadel, W. G., & Scott, W. D. (2004). Self-efficacy beliefs and the architecture of personality. In K. D. Vohs & R. F. Baumeister (Eds.), *Handbook of self-regulation: Research, theory, and applications* (pp. 188–210). New York, NY: Guilford Press.

Collie, R. J., Shapka, J. D., & Perry, N. E. (2012). School climate and social–emotional learning: Predicting teacher stress, job satisfaction, and teaching efficacy. *Journal of Educational Psychology*, *104*(4), 1189–1204.

De Jong, R., Mainhard, T., Van Tartwijk, J., Veldman, I., Verloop, N., & Wubbels, T. (2014). How pre-service teachers' personality traits, self-efficacy, and discipline strategies contribute to the teacher–student relationship. *British Journal of Educational Psychology*, *84*(2), 294–310.

Dellinger, A. B., Bobbett, J. J., Olivier, D. F., & Ellett, C. D. (2008). Measuring teachers' self-efficacy beliefs: Development and use of the TEBS-Self. *Teaching and Teacher Education*, *24*(3), 751–766.

Dicke, T., Parker, P. D., Marsh, H. W., Kunter, M., Schmeck, A., & Leutner, D. (2014). Self-efficacy in classroom management, classroom disturbances, and emotional exhaustion: A moderated mediation analysis of teacher candidates. *Journal of Educational Psychology*, *106*(2), 569–583.

Fackler, S., & Malmberg, L.-E. (2016). Teachers' self-efficacy in 14 OECD countries: Teacher, student group, school and leadership effects. *Teaching and Teacher Education*, *56*, 185–195.

Fernet, C., Guay, F., Senécal, C., & Austin, S. (2012). Predicting intraindividual changes in teacher burnout: The role of perceived school environment and motivational factors. *Teaching and Teacher Education*, *28*(4), 514–525.

Freeman, C., O'Malley, K., & Eveleigh, F. (2014). ***Australian teachers and the learning environment. An analysis of teacher response to TALIS 2013***. Final report. London, U.K.: ACER.

Friedman, I. A., & Kass, E. (2002). Teacher self-efficacy: A classroom-organization conceptualization. *Teaching and Teacher Education*, *18*, 675–686.

Gibson, S., & Dembo, M. H. (1984). Teacher efficacy: A construct validation. *Journal of Educational Psychology*, *76*(4), 569–582.

Goddard, R. D., Hoy, W. K., & Hoy, A. W. (2000). Collective teacher efficacy: Its meaning, measure, and impact on student achievement. *American Educational Research Journal*, *37*(2), 479–507.

Gold, B., Hellermann, C., & Holodynski, M. (2017). Effekte videobasierter Trainings zur Förderung der Selbstwirksamkeitsüberzeugungen über Klassenführung im Grundschulunterricht. *Zeitschrift für Erziehungswissenschaft*, *20*(1), 115–136.

Guo, Y., Connor, C. M., Yang, Y., Roehrig, A. D., & Morrison, F. J. (2012). The effects of teacher qualification, teacher self-efficacy, and classroom practices on fifth graders' literacy outcomes. *The Elementary School Journal*, *113*(1), 3–24.

Guo, Y., Piasta, S. B., Justice, L. M., & Kaderavek, J. N. (2010). Relations among preschool teachers' self-efficacy, classroom quality, and children' language and literacy gains. *Teaching and Teacher Education*, *26*(4), 1094–1103.

Henson, R. K. (2001). *Teacher self-efficacy: Substantive implications and measurement dilemmas*. Paper presented at the Annual Meeting of the Educational Research Exchange, College Station, TX.

Holzberger, D., Philipp, A., & Kunter, M. (2013). How teachers' self-efficacy is related to instructional quality: A longitudinal analysis. *Journal of Educational Psychology*, *105*(3), 774–786.

Hoy, W. K., & Woolfolk, A. E. (1993). Teachers' sense of efficacy and the organizational health of schools. *The Elementary School Journal*, *93*(4), 355–372.

Huberman, M. (1989). The professional life cycle of teachers. *Teachers College Record*, *91*(1), 31–57.

Kelm, J. L., & McIntosh, K. (2012). Effects of school-wide positive behavior support on teacher self-efficacy. *Psychology in the Schools*, *49*(2), 137–147.

Kilday, J. E., Lenser, M. L., & Miller, A. D. (2016). Considering students in teachers' self-efficacy: Examination of a scale for student-oriented teaching. *Teaching and Teacher Education*, *56*, 61–71.

Klassen, R. M., & Chiu, M. M. (2010). Effects on teachers' self-efficacy and job satisfaction: Teacher gender, years of experience, and job stress. *Journal of Educational Psychology*, *102*(3), 741–756.

Klassen, R. M., Tze, V. M., Betts, S. M., & Gordon, K. A. (2011). Teacher efficacy research 1998–2009: Signs of progress or unfulfilled promise? *Educational Psychology Review*, *23*(1), 21–43.

Lazarides, R., Buchholz, J., & Rubach, C. (2018). Teacher enthusiasm and self-efficacy, student-perceived mastery goal orientation, and student motivation in mathematics classrooms. *Teaching and Teacher Education*, *69*, 1–10.

Lazarides, R., Fauth, B., Gaspard, H., & Göllner, R. (2019). Teacher motivation and change in student-perceived teaching quality after the transition to secondary school. *manuscript submitted for publication*.

Lazarides, R., Watt, H. M. G., & Richardson, P. (2019). Longitudinal influences among teachers' self-efficacy, instructional behaviors and teaching contexts from beginning until mid-career. *manuscript submitted for publication*.

Lent, R. W., & Hackett, G. (1987). Career self-efficacy: Empirical status and future directions. *Journal of Vocational Behavior*, *30*(3), 347–382.

Marsh, H. W., Pekrun, R., Parker, P. D., Murayama, K., Guo, J., Dicke, T., & Arens, A. K. (2018). The murky distinction between self-concept and self-efficacy: Beware of lurking jingle-jangle fallacies. *Journal of Educational Psychology*, *111*(2), 331–353.

McIntyre, D., & Hagger, H. (1996). *Mentors in schools: Developing the profession of teaching*. London, U.K.: David Fulton Publishers.

Meristo, M., & Eisenschmidt, E. (2014). Novice teachers' perceptions of school climate and self-efficacy. *International Journal of Educational Research*, *67*, 1–10.

Moè, A., Pazzaglia, F., & Ronconi, L. (2010). When being able is not enough. The combined value of positive affect and self-efficacy for job satisfaction in teaching. *Teaching and Teacher Education 26*(5), 1145–1153.

Morris, D. B., & Usher, E. L. (2011). Developing teaching self-efficacy in research institutions: A study of award-winning professors. *Contemporary Educational Psychology*, *36*(3), 232–245.

O'Connor, R., & Korr, W. S. (1996). A model for school social work facilitation of teacher self-efficacy and empowerment. *Children and Schools*, *18*(1), 45–51.

Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research*, *66*(4), 543–578.

Pakarinen, E., Lerkkanen, M.-K., Poikkeus, A.-M., Kiuru, N., Siekkinen, M., Rasku-Puttonen, H., … Nurmi, J.-E. (2010). A validation of the classroom assessment scoring system in Finnish kindergartens. *Early Education and Development*, *21*(1), 95–124.

Pas, E. T., Bradshaw, C. P., & Hershfeldt, P. A. (2012). Teacher-and school-level predictors of teacher efficacy and burnout: Identifying potential areas for support. *Journal of School Psychology*, *50*(1), 129–145.

Praetorius, A.-K., Lauermann, F., Klassen, R. M., Dickhäuser, O., Janke, S., and Dresel, M. (2017). Longitudinal relations between teaching-related motivations and student-reported teaching quality. *Teaching and Teacher Education*, *65*, 241–254.

Richter, D., Kunter, M., Lüdtke, O., Klusmann, U., Anders, Y., & Baumert, J. (2013). How different mentoring approaches affect beginning teachers' development in the first years of practice. *Teaching and Teacher Education*, *36*, 166–177.

Ross, J. A., & Bruce, C. (2007). Professional development effects on teacher efficacy: Results of randomized field trial. *The Journal of Educational Research*, *101*(1), 50–60.

Rothmann, A. J., Baldwin, A. S., Hertel, A., & Fuglestad, P. (2011). Self-regulation and behavioral change. Disentangling behavioral initiation and behavioral maintenance. In K. D. Vohs & R. F. Baumeister (Eds.), *Handbook of self-regulation: Research, theory, and applications* (pp. 106–124). New York, NY: Guilford Press.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs*, *80*(1), 1–28.

Yoon, J. (2002). Teacher characteristics as predictors of teacher-student relationships: Stress, negative affect, and self-efficacy. *Social Behavior and Personality: An International Journal*, *30*(5), 485–493.

Schleicher, A. (2018). ***Valuing our teachers and raising their status: How communities can help. International Summit on the Teaching Profession***. Paris, France: OECD.

Schunk, D. H. (1987). Peer models and children's behavioral change. *Review of educational Research*, *57*(2), 149–174.

Schunk, D. H. (1995). Self-efficacy and education and instruction. In J. E. Maddux (Ed.), *Self-efficacy, adaptation, and adjustment* (pp. 281–303). New York, NY: Springer.

Schunk, D. H., & Zimmerman, B. J. (1997). Social origins of self-regulatory competence. *Educational Psychologist*, *32*(4), 195–208.

Schwarzer, R., & Hallum, S. (2008). Perceived teacher self-efficacy as a predictor of job stress and burnout: Mediation analyses. *Applied Psychology*, *57*(1), 152–171.

Shavelson, R. J., Hubner, J. J., & Stanton, G. C. (1976). Self-concept: Validation of construct interpretations. *Review of educational Research*, *46*(3), 407–441.

Sitzmann, T., & Yeo, G. (2013). A meta-analytic investigation of the within-person self-efficacy domain: Is self-efficacy a product of past performance or a driver of future performance? *Personnel Psychology*, 66, 531–568.

Skaalvik, E. M., & Skaalvik, S. (2007). Dimensions of teacher self-efficacy and relations with strain factors, perceived collective teacher efficacy, and teacher burnout. *Journal of Educational Psychology*, *99*(3), 611–625.

Skaalvik, E. M., & Skaalvik, S. (2010). Teacher self-efficacy and teacher burnout: A study of relations. *Teaching and Teacher Education*, *26*(4), 1059–1069.

Staub, F. C., & Stern, E. (2002). The nature of teachers' pedagogical content beliefs matters for students' achievement gains: Quasi-experimental evidence from elementary mathematics. *Journal of Educational Psychology*, *94*(2), 344.

Stipek, D. (2012). Context matters: Effects of student characteristics and perceived administrative and parental support on teacher self-efficacy. *The Elementary School Journal*, *112*(4), 590–606.

Sugai, G., & Horner, R. H. (2009). Responsiveness-to-intervention and school-wide positive behavior supports: Integration of multi-tiered system approaches. *Exceptionality*, *17*(4), 223–237.

Talsma, K., Schüz, B., Schwarzer, R., & Norris, K. (2018). I believe, therefore I achieve (and vice versa): A meta-analytic cross-lagged panel analysis of self-efficacy and academic performance. *Learning and Individual Differences*, *61*, 136–150.

Tschannen-Moran, M., & Barr, M. (2004). Fostering student learning: The relationship of collective teacher efficacy and student achievement. *Leadership and Policy in Schools 3*(3), 189–209.

Tschannen-Moran, M., Hoy, A. W., & Hoy, W. K. (1998). Teacher efficacy: Its meaning and measure. *Review of Educational Research*, *68*(2), 202–248.

Tschannen-Moran, M., & McMaster, P. (2009). Sources of self-efficacy: Four professional development formats and their relationship to self-efficacy and implementation of a new teaching strategy. *The Elementary School Journal*, *110*(2), 228–245.

Tschannen-Moran, M., & Woolfolk Hoy, A. (2007). The differential antecedents of self-efficacy beliefs of novice and experienced teachers. *Teaching and Teacher Education*, *23*(6), 944–956.

Warner, L. M., & French, D. (2019). Self-efficacy interventions. In M. Hagger, L. Cameron, K. Hamilton, N. Hankonen, & T. Lintunen (Eds.), *Handbook of behavior change*. Cambridge, U.K.: Cambridge University Press.

Wolters, C. A., & Daugherty, S. G. (2007). Goal structures and teachers' sense of efficacy: Their relation and association to teaching experience and academic level. *Journal of Educational Psychology*, *99*(1), 181–193.

Woolfolk, A. E., Rosoff, B., & Hoy, W. K. (1990). Teachers' sense of efficacy and their beliefs about managing students. *Teaching and Teacher Education*, *6*(2), 137–148.

Woolfolk Hoy, A., & Spero, R. B. (2005). Changes in teacher efficacy during the early years of teaching: A comparison of four measures. *Teaching and Teacher Education*, *21*(4), 343–356.

Zee, M., Koomen, H. M., & de Jong, P. F. (2018). How different levels of conceptualization and measurement affect the relationship between teacher self-efficacy and students' academic achievement. *Contemporary Educational Psychology*, *55*, 189–200.

Rebecca Lazarides

University of Potsdam

Lisa Marie Warner

MSB Medical School Berlin