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How to Improve Teaching Practices: The Role of Teacher Motivation, Organizational Factors, and Leadership Practices

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Abstract

Purpose: Although it is expected that building schoolwide capacity for teacher learning will improve teaching practices, there is little systematic evidence to support this claim. This study aimed to examine the relative impact of transformational leadership practices, school organizational conditions, teacher motivational factors, and teacher learning on teaching practices. **Research Design:** Data were collected from a survey of 502 teachers from 32 elementary schools in the Netherlands. A structural model was tested on the within-school covariance matrix and a chi-square test taking into account nonindependence of observations. **Findings:** Results suggest that teachers' engagement in professional learning activities, in particular experimenting

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and reflection, is a powerful predictor for teaching practices. Teachers' sense of self-efficacy appeared to be the most important motivational factor for explaining teacher learning and teaching practices. Motivational factors also mediate the effects of school organizational conditions and leadership practices on teacher learning and teaching practices. Finally, transformational leadership practices stimulate teachers' professional learning and motivation and improve school organizational conditions. **Conclusions:** For school leaders, to foster teacher learning and improve teaching practices a combination of transformational leadership behaviors is required. Further research is needed to examine the relative effects of transformational leadership dimensions on school organizational conditions, teacher motivation, and professional learning in schools. Finally, conditions for school improvement were examined at one point in time. Longitudinal studies to school improvement are required to model changes in schools' capacities and growth and their subsequent effects on teaching practices.

Keywords

organization, school leadership, teacher learning, teacher motivation, teaching

School effectiveness research has clearly shown that student outcomes depend highly on the quality of instruction (Creemers, 1994; Scheerens, 2008; Scheerens & Bosker, 1997). Given these teaching effects, fostering the professional development of teachers seems to be a key challenge for governments, local politicians, and school managers in and outside the United States to improve the quality of education. As a consequence, schools are expected to improve teaching through enhancing capacity building for individual and collective learning in schools. Building schoolwide capacity to promote professional learning is also considered an important prerequisite for addressing the continuous stream of changes (demographic changes and sociocultural renewal) and different restructuring demands, including large-scale reforms and tightened "output" controls, introduced by accountability policies, with which schools in and outside the United States are faced.

To understand how schools can cope with these changes and demands, researchers have started to examine the impact of professional communities on teacher learning and sustained improvement (Hord, 1997; Mitchell & Sackney, 2000; Sleegers, Bolhuis, & Geijsel, 2005; Stoll, Bolam, McMahon, Wallace, & Thomas, 2006; Toole & Louis, 2002). Although scholars use a variety of terms to describe how teachers' learning is linked with whole school capacity for improvement, they generally conceptualize professional community as including

dimensions such as a focus on student learning, shared values and vision, teacher collaboration, reflective professional inquiry, and collective and individual learning (Louis & Marks, 1998; McLaughlin & Talbert, 2006; Mitchell & Sackney, 2000; Sackney, Walker, Mitchell, & Duncan, 2005; Stoll et al., 2006; Toole & Louis, 2002). The studies that have been carried out indicate that strong professional communities promote teacher learning and improve teaching practices more easily compared to weak professional communities (Lee & Smith, 1996; Louis & Marks, 1998; Wiley, 2001).

Although this research has received much attention in the literature, it has some limitations (Stoll et al., 2006; Toole & Louis, 2002). Despite the expectation that building schoolwide capacity for teacher learning will improve teaching practice, there is little rigorous systematic evidence to support this claim (see, e.g., Vescio, Ross, & Adams, 2008; Visscher & Witziers, 2004). Furthermore, little attention has been devoted to the development and validation of complex multilevel models in which the chain of variables, which are located among different dimensions of professional communities, teacher learning, and teaching practices, are described. These models could provide more insight into the paths and mechanisms through which dimensions of professional communities have an impact on teaching practice (Coburn & Russell, 2008). Finally, most of the studies use a system theory of change that links structural and cultural dimensions of school workplace environments to professional learning. As a consequence, the role of psychological factors in explaining the role of professional learning to improve teaching practice is largely ignored. There is evidence that psychological factors such as career motivation, self-efficacy, teacher autonomy and perceived control, and teachers' sense making affect teachers' learning and improve their teaching (Coburn, 2001, 2003; Rosenholtz, 1991; Runhaar, 2008; Spillane, Reiser, & Reimer, 2002; van Veen, Sleegers, & van de Ven, 2005). Although scholars have stressed the need for research that focuses on the interplay between psychological and organizational antecedents to explain teacher learning and change (Richardson & Placier, 2001; Smylie, 1988; Smylie & Hart, 1999), systematic research is scarce. The results of the few available studies show that the impact of different structural and cultural dimensions of the school organization on teaching practices appears to be mediated by psychological factors (Geijsel, Sleegers, Stoel, & Krüger, 2009; Kwakman, 2003; Smylie, 1988; Smylie, Lazarus, & Brownlee-Conyers, 1996).

This study aimed to contribute to this line of research by examining the relative impact of leadership practices, school organizational conditions, teacher motivational factors, and teacher learning on teaching practices. It does so by testing a model that hypothesizes the relationships among these factors. This

structural model was tested using data from 502 teachers of 32 Dutch elementary schools.

Framework

The framework used to guide our inquiry is based on a general model of employee performance as developed in research on organizational and industrial policy (Rowan, 1996). The model assumes that variations in professional performance are a function of the capacities and motivations of workplace personnel, the characteristics of the organizational setting in which they work, and the external social and political environment. Drawing on this model, Leithwood, Jantzi, and Mascall (2002) have developed a framework that can help to guide research on large-scale reforms. Their framework suggests that variations in the success of large-scale reform can be explained in terms of their influence on educators' motivations and capacities as well as their work settings that facilitate the types of changes in school and especially classroom practices needed for significant gains in whatever student outcomes are aspired to by reformers.

We used this framework and research on teacher learning and motivation, school capacity building, and leadership practices to develop a model consisting of several variables, embedded in five general constructs, and the relationships among these variables and constructs (see Figure 1). According to this model, it is assumed that teachers will have better teaching practices, in terms of quality of instruction, when they are more engaged in professional learning activities. Transformational leadership, school organizational conditions, and teacher motivation have indirect effects on the quality of teaching practices through teachers' engagement in professional learning activities. Transformational forms of school leadership have direct effects on school organizational conditions and teacher motivation. Such leadership also has indirect effects on teacher motivation through school organizational conditions. Although not measured in these study, it is assumed that the quality of instruction will in turn affect student learning.

To elaborate the model more fully, we now describe the different variables and pose hypotheses around the relationships among the variables of the model.

Teaching Practices: Approaches to Teaching

Research in the effective school tradition published in the past decades has identified components of effective instructional strategies (Creemers, 1994; Scheerens & Bosker, 1997). The available evidence suggests that structured

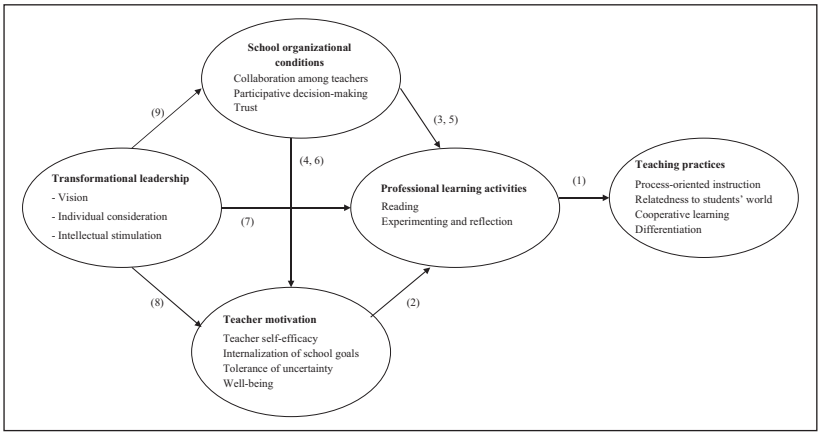

Figure 1. Theoretical model of the relations among teacher motivational factors, school organizational conditions, leadership practices, professional learning activities, and teaching practices (with hypotheses in parentheses)

and direct forms of teaching, including components such as stating clear goals, time on task, opportunity to learn, high expectation, supportive classroom climate, frequent monitoring, and feedback and goal-oriented assessment, affect student outcomes (Creemers, 1994; Fraser, Walberg, Welch, & Hattie, 1987; Walberg, 1986; Wang, Haertel, & Walberg, 1993). Although research using this "traditional" behavioristic view on teaching has increased our insight into key components of effective teaching practice, researchers have started to pay more attention to constructivist views on learning and its meaning for teaching. Constructivist approaches to teaching stress the need for creating learning environments that stimulate self-regulated and active learning, acknowledge differences between students, and are connected to authentic and real-life contexts (de Kock, Sleegers, & Voeten, 2004; Shuell, 1996).

Recently, Scheerens (2008) conducted a meta-analysis of instructional and school effectiveness in which the effects of both traditional and constructivist approaches to teaching were analyzed. The meta-analysis was based on 177 studies on instructional effectiveness published between 1985 and 2005. To assess the effectiveness of instruction, 15 components were identified which were categorized into six groups, including structured and direct teaching strategies (e.g., mastery learning, practice and drill, focus on outcomes and goals) and constructivist-oriented instructional strategies (active learning, instruction on learning strategies, authentic contexts, and real-life learning

environments). The results showed that of all the six distinguished categories, constructivist-oriented instructional strategies had the biggest effect (effect size of 0.14) on student outcomes, followed by structured and direct forms of instruction (effect size of 0.9). Given these findings, we focus on instruction that is based on constructivist approaches to teaching. In this study, we distinguished the following four instructional strategies: process-oriented teaching, relatedness to student's world, cooperative learning, and differentiation. In the next section, we describe these constructivist-oriented instructional strategies briefly.

Teaching Practices: Instructional Strategies

Recent research shows that increasing students' self-regulation seems to have positive effects on students' motivation and performance, although it is unclear whether these findings apply to all students (Oostdam, Peetsma, & Blok, 2007). A model of teaching that facilitates and enhances self-regulated learning is called process-oriented instruction (Bolhuis & Voeten, 2001; Vermunt, 1995; Volet, 1995). Process-oriented instruction implies that the external control of the learning process by teachers shifts gradually to an internal control over the learning process by students themselves. Furthermore, teachers using process-oriented instruction focus on knowledge building in the domain (subject area), pay attention to emotional aspects of learning, and treat learning processes and results as social phenomena (Bolhuis, 2003). Research suggests that process-oriented instruction facilitates (meta)cognitive strategies and attitudes toward learning and fosters problem-solving skills in the domains of math and language (Brand-Gruwel, Aarnoutse, & Van den Bos, 1997; Cantrell, 1999; Verschaffel et al., 1999).

Besides the emphasis on self-regulated learning, constructivist conceptions of learning also acknowledge differences in students' learning because of differences in social, cultural, and cognitive characteristics such as socioeconomic background, ethnicity, social and cultural capital, intelligence, and cognitive strategies (Verschaffel & de Corte, 1999). Through attuning their instruction to the *potential* competence of students, often referred to as Vygotsky's zone of proximal development, teachers stimulate students' competence and learning. Teachers should therefore pay attention to these differences and differentiate in their instruction and tasks, instead of focusing on the classes as a whole. In a review study on the effect of differentiation in the classroom on students' academic development in primary education, Blok (2004) found a scarce positive effect of differentiation. Mainly in a few experimental studies, attuning the instruction to the potential competence and

needs of students favored the development of students more than whole-class instruction. Although the effects might be scarce so far, teachers' differentiation in instruction was meant to have a positive effect.

Constructivist conceptions of learning also pay attention to the situated nature of learning. Although the idea that learning is a situated activity had already been reflected in the work of John Dewey in the beginning of the 20th century, recently some educational psychologists have started to systematically examine the situated nature of knowledge and learning (Anderson, Reder, & Simon, 1996; Putnam & Borko, 2000). These theorists emphasize that human thought and the appropriation of knowledge are inextricably linked to the social and cultural context and that learning can therefore be fundamentally considered as a situated activity (Clancy, 1997). Learning should therefore take place in authentic contexts or so-called "practice fields" or in "realistic" situations (by using situated simulation models and multiple representations), in which learners can practice skills and domain-related activities that they will encounter outside school as well. Teachers who use these kinds of rich situational settings encourage a better person–environment fit and enhance students' motivation and performance in a positive way. Several empirical studies offer support for the claim that these new types of learning environments give learners affordances to extend their cognitive abilities, problem-solving skills, and knowledge (Cognition and Technology Group at Vanderbilt, 1992; de Jong & van Joolingen, 1998).

A rather well-conceived and studied teaching practice that influences student outcomes is cooperative learning. Both motivational and learning perspectives form the theoretical basis of cooperative learning (Slavin, 1996). Drawing on motivational theories, it is assumed that positive interdependence (cooperation) is based on intrinsic motivation and interaction that encourage and facilitate learners' efforts and that may result in a variety of outcomes such as high achievement, positive relationships, and psychological well-being (Johnson & Johnson, 1999; Krol-Pot, 2005). When students are not intrinsic motivated, teachers should reward group performance to create positive interaction and interpersonal reward structure in which group members will provide or withhold social reinforcement in response to group mates' task-related efforts. Based on theories about learning, it is assumed that social interaction between students will increase student achievement (De Lisi & Golbeck, 1999). From this view, students can learn from exchanges of ideas, information, perspectives, and opinions from competent peers, which mediates the development of higher mental functions such as language, thinking, and reasoning (Piaget, 1959; Tudge & Winterhoff, 1993; Vygotsky, 1978). Research into cooperative learning has shown that cooperative learning positively

influences both cognitive and noncognitive outcomes (Johnson & Johnson, 1989; Slavin, 1995).

From a constructivist view on learning and teaching, teachers' teaching practice is better when teachers use these instructional strategies more often. In the following sections, we use theories of adult learning and motivation and research on professional learning communities and leadership to identify which organizational conditions and psychological factors affect the instructional strategies teachers use. As mentioned earlier, though we assume that the quality of their instruction will in turn affect student learning (teaching effects), we do not test this assumption.

Teachers' Professional Learning

Because of the contrary results with respect to the effectiveness of professional development programs, scholars have started to develop newer conceptualizations of teachers' professional development that move beyond "one-shot" approaches such as workshops, training, and conferences (Desimone, 2009). Inspired by adult learning theories and situated cognitive perspectives on learning, the idea of ongoing and lifelong professional learning embedded in schools as a natural and expected component of professional activities of teachers and a key component to improve the quality of instruction and school improvement has been emphasized more and more by researchers in the field of teacher learning (Clarke & Hollingsworth, 2002; Jarvis, 1987; Kwakman, 2003; Marsick & Watkins, 1990; Putnam & Borko, 2000; Sleegers et al., 2005; Smylie, 1995). From this perspective, the focus of teacher learning is on teachers' engagement in a variety of professional learning activities within schools and on becoming a participant in a community of learners (Sfard, 1988; ten Dam & Blom, 2006). By being engaged in professional learning activities within the school context, teachers stimulate both their own professional development and the development of the school and thus make a significant contribution to improving teaching practices.

To improve schools as places for teachers to learn, it is important to acknowledge that not all teacher learning is conducive to changing teaching practice. Acknowledging this raises the important question of which professional activities teachers need to be engaged in to improve their teaching and thus which types of learning activities need to be promoted. Based on a review of adult learning theories, Smylie (1995) distinguished four crucial learning outcomes: conceptual change, reflective thinking, experimentation, and innovation. Kwakman (2003) and Lohman and Woolf (2001) found types of professional learning activities that were similar to those Smylie referred

to as teacher learning outcomes. Like Smylie (1995), they identified experimenting and reflection as important activities teachers are engaged in as part of their work to improve their practice and promote student learning. In addition to these activities, they also considered collecting new knowledge and keeping up to date with new insights and developments such as teaching methods, curriculum, and teaching as crucial for teachers to deal with rapid changes in their work. Although keeping up to date as a learning activity differs from Smylie's conceptual change as a learning outcome, both concepts stress the importance of the input of and search for new information, insights, and developments from different sources for the professional knowledge base underlying teachers' work.

In this study, we consider teachers' learning as the engagement of teachers in three professional learning activities: keeping up to date, experimenting, and reflection. Research has shown that active learning (observing, discussion, planning, feedback, reflection) and enhancing knowledge (study groups, conferences, etc.) affect teaching practice (Garet, Porter, Desimone, Birman, & Yoon, 2001; Geijsel, Sleegers, van den Berg, & Kelchtermans, 2001; Runhaar, 2008; Supovitz, 2002). Based on this, we therefore expect that teachers' engagement in professional learning activities positively affects their teaching practices (Hypothesis 1).

Teacher Motivation

In motivation research, a distinction has been made between motivated behavior and motivational factors. Motivated behavior, including professional learning and teaching behavior, is positively influenced by motivational factors (Maehr & Braskamp, 1986; Roede, 1989). Motivational factors typically comprise three components: expectancy, value, and affective components (Peetsma, Hascher, van der Veen, & Roede, 2005; Pintrich & De Groot, 1990). The *expectancy* component of motivation has been conceptualized in a variety of ways in the motivational literature (e.g., perceived competence, self-efficacy, attributional style, and control beliefs), but the basic construct involves teachers' beliefs about their ability to perform a task, often referred to as teacher self-efficacy (Bandura, 1997). Self-efficacy is a future-oriented belief about the level of competence that a person expects he or she will display in a given situation. When teachers have a high sense of self-efficacy, they tend to exhibit greater levels of planning and organization, are more open to new ideas and more willing to experiment with new methods, work longer with students who are struggling, intensify their efforts when their performance falls short of their goals, and persist longer.

Research has shown that teacher efficacy positively influences teachers' engagement in professional learning activities and subsequently enhances the quality of the instruction (Geijsel et al., 2009; Goddard, Hoy, & Hoy, 2000; Smylie, 1988; Tschannen-Moran & Woolfolk Hoy, 2001; Wheatley, 2002).

The *value component* concerns teachers' goals for doing a task and the importance and interest attributed to the task. Motivational processes are a function of one's personal goals and of beliefs about one's capacities and one's context (Bandura, 1986; Ford, 1992). Research on teacher commitment to change has often suggested that a strong belief in and acceptance of the organization's goals and values is an element of teacher motivation (Geijsel et al., 2009; Leithwood, Jantzi, & Steinbach, 1999). Therefore, in this study we considered teachers' beliefs in and internalization of the school's goals and values as personal goals and values as an element of teacher motivation. In accordance with the effects of internalization of goals in self-determination theory (Ryan & Deci, 2000), research has shown that teachers' internalization of school goals into personal goals influences their professional learning, both directly and through teacher self-efficacy (Geijsel, Sleegers, Leithwood, & Jantzi, 2003; Leithwood et al., 1999; Wolbers & Woudenberg, 1995).

The third motivational component, the *affective* component, refers to teachers' feelings or emotional reactions to their task or the school in general. Although researchers stress the importance of analyzing teachers' emotions, systematic research on the role teachers' emotions play in promoting teachers' learning and reform processes is still missing (Hargreaves, 2001; Nias, 1996; Spillane et al., 2002; van den Berg, 2002; van Veen, 2003), and very little research has examined teachers' emotions in relation to the current reforms. The few studies that have been carried out suggest that teachers may feel a concern for their well-being, often resulting in feelings of uncertainty (van Veen & Sleegers, 2009). The way teachers deal with uncertain situations, often caused by policy initiatives fostering educational change, depends on the tolerance of uncertainty (Sorrentino & Short, 1986). Uncertain teachers are more prone to working in a routine way, avoiding risks, and maintaining their present attitudes, whereas more certain teachers search for new information, are more flexible in their approaches (Lortie, 1975; Rosenholtz, 1991), and are more willing to engage in professional learning activities (Geijsel et al., 2001; van Veen & Sleegers, 2006).

Based on the findings of the aforementioned studies, we expect that the effect of different teacher motivational factors on teaching practices will be mediated by teachers' engagement in professional learning activities (Hypothesis 2).

School Organizational Conditions

Previous studies into schools as professionals communities have shown that organizational factors such as teacher interactions and cooperation, participative decision making, and a climate of trust can foster teachers' professional learning in schools (Bryk, Camburn, & Louis, 1999; Kwakman, 2003; Leithwood et al., 1999; Tschannen-Moran & Hoy, 1998; van Woerkom, Nijhof, & Nieuwenhuis, 2002).

Collaborative experiences and the exchange of knowledge and ideas are at the core of professional learning communities. Cooperative, friendly, and collegial relationships, open communication, and free exchange of ideas may provide emotional and psychological support for teachers' work. Collaboration also provides opportunities for teachers to work together to solve problems, to provide feedback and information, and to assist and support (Kwakman, 2003; Rosenholtz, 1991; Sleegers, van den Berg, & Geijsel, 2000; Timperley & Robinson, 1998). Several studies have shown that teacher collaboration can have strong positive effects on teachers' professional learning and can, if it is focused on student learning, help to improve teaching practices (Bryk et al., 1999; Geijsel, 2001; Louis & Marks, 1998; Munthe, 2003; Rosenholtz, 1989; Smylie, 1988; Stoll et al., 2006). Therefore, we expect that the effect of teacher collaboration on teachers' teaching practices will be mediated by teachers' engagement in professional learning activities (Hypothesis 3).

Participation in decision making refers to joint decision making or shared influence in decision-making processes by a superior and the employees. Participative decision making may increase teachers' ownership of organizational goals and can reinforce the extent to which teachers have internalized school goals and values as their personal goals (Sleegers et al., 2005; Smylie, 1988; Smylie et al., 1996). Moreover, a sense of involvement is a critical foundation on which to deepen and sustain change efforts in schools. As such, teacher participation in decision making can add to the internalization of organizational goals as personal goals and teachers' sense of self-efficacy and thus motivate teacher learning. Positive effects of participative decision making on teacher motivation have been found in several empirical studies (e.g., Jongmans, Sleegers, Biemans, & de Jong, 2004; Rowan, Raudenbush, & Cheong, 1993; Smylie et al., 1996). On the basis of these findings and our expectations about the effects of teacher motivation on teachers' engagement in professional learning activities (see Hypothesis 2), we expect that the benefits of participative decision making for teachers' engagement in professional learning activities and teaching practices will be mediated by teacher motivation (Hypothesis 4).

More and more, researchers stress the role of trust as one of the key components of professional learning communities because it reduces teachers' feelings of uncertainty and vulnerability (Bryk & Schneider, 2002; Coburn & Russell, 2008). Trust refers to "an individual's or group's willingness to be vulnerable to another party based on the confidence that the latter party is benevolent, reliable, competent, honest and open" (Cummings & Bromiley, 1996). High relational trust can make teachers feel and believe that improving the quality of education and student learning is both an individual and collective enterprise. This will positively affect their engagement in professional learning activities. Furthermore, in organizations with a high level of trust, participants are more willing and able to invest their energies in contributing to organizational goals (Podsakoff, MacKenzie, Moorman, & Fetter, 1990, cited in Tschannen-Moran, 2001). Research has indeed shown that trust has positive effects on teacher professionalism (Tschannen-Moran & Hoy, 1998) and teacher motivation (Smylie, 1999). Based on these findings and our expectations about the effects of teacher motivation on teachers' engagement in professional learning activities (see Hypothesis 2), we expect that the positive effect of trust on teaching practice will be mediated by teachers' engagement in professional learning activities (Hypothesis 5) and that the benefits of trust for teachers' engagement in professional learning activities and teaching practices will be mediated by teacher motivation (Hypothesis 6).

Transformational Leadership

Leadership is widely regarded as playing a significant role in school improvement and educational change, especially as it is inspired by the concept of transformational leadership (Leithwood et al., 1999; Leithwood & Sleegers, 2006). This concept of leadership, as developed by Burns (1978), fundamentally aims to foster capacity development and higher levels of personal commitment to organizational goals on the part of the followers, resulting in extra effort and greater productivity (Bass, 1985; Bass & Avolio, 1994; Burns, 1978). Research on transformational leadership in educational settings has identified three core dimensions of transformational leadership in schools: vision building through initiating and identifying a vision for the school's future, providing individual support, and providing intellectual stimulation (Geijsel, Sleegers, & van den Berg, 1999; Leithwood et al., 1999; Leithwood & Jantzi, 2006; Nguni, Sleegers, & Denessen, 2006). Through *initiating and identifying a vision*, school leaders contribute to vision building in the school that generates excitement, builds emotional attachment, reinforces the personal

and social identification of followers with the organization, and thus increases collective cohesion. As a consequence, teachers may be more willing to internalize organizational goals as their own personal goals and may have more confidence in their ability to attain the vision. *Individual support or consideration* represents an attempt to understand, recognize, and satisfy followers' concerns and needs while treating each follower uniquely. Furthermore, by acting as a role model, coaching, delegating challenging tasks, and providing feedback, school leaders may help to link teachers' current needs to the school's goals and mission and enhance teachers' sense of self-efficacy. Through *intellectual stimulation*, transformational school leaders encourage teachers to question their own beliefs, assumptions, and values and enhance teachers' ability to solve individual, group, and organizational problems.

Despite the expectation that transformational leadership practices enhance teachers' engagement in professional learning activities, there is still little evidence for this claim (Leithwood, Harris, & Hopkins, 2008; Leithwood & Jantzi, 2006). Recently, Leithwood et al. (2008) found some evidence that principals make modest direct contributions to staff capacities and performance (e.g., Leithwood et al., 2008; Leithwood & Jantzi, 2006; Leithwood & Mascall, 2008). Based on this, we therefore expect that the effects of transformational leadership on teaching practices are mediated by teachers' engagement in professional learning activities (Hypothesis 7).

Far more evidence is available for the effects of transformational leadership on teacher motivation and extra effort (Geijsel et al., 2003; Leithwood et al., 1999; Leithwood & Sun, 2009; Nguni et al., 2006; Ross & Gray, 2006). Based on these findings and our expectations about the effects of teacher motivation on teachers' learning and teaching practices (see Hypothesis 2), we expect that the benefits of transformational leadership for teachers' engagement in professional learning activities and teaching practices will be mediated by teacher motivation (Hypothesis 8).

Although researchers have learned a great deal about the effects of transformational leadership on individual and organizational outcomes, less is known about the role that teamwork processes may play in the link between transformational leadership and individual, team, and organizational performance. Dionne, Yammarino, Atwater, and Spangler (2004) proposed a model of the relations among transformational leadership, teamwork processes, and team performance. They expected that vision building, individual consideration, and intellectual stimulation would improve teamwork processes by producing shared vision, team commitment and trust, and functional team conflict. Although evidence concerning these claims in schools is extremely thin, some research has suggested that transformational leadership can enhance

Table 1. Comparison of Sample and Population Background Characteristics: Results of the One-Sample *t* Tests

	M	*SD*	*N*	*t*	*df*	*p*
Number of students	275.2	120.28	32	–0.65	31	.53
Number of teachers	22.73	8.68	32	–0.083	31	.41
Proportion of students with low socioeconomic status	0.19	0.18	32	0.80	31	.43

teamwork processes and school conditions such as teacher participation in decision making and collaboration, shared mission, relational trust, collective efficacy, school culture, and organizational learning, which in turn influence teaching and learning in school (Leitwood & Sun, 2009; Mulford & Silins, 2003; Sleegers, Geijsel, & van den Berg, 2002). Based on these findings and our expectations about the effects of school organizational conditions on teacher motivation, teachers' engagement in professional learning activities, and teaching practices (see Hypotheses 3, 4, and 5), we expect that the benefits of transformational leadership for teachers' engagement and teaching practices will be mediated by collaboration among teachers, participative decision making, and trust (Hypothesis 9).

Method

Sample

The study described in this article is part of a survey on school improvement in elementary education. Participants were teachers from 32 elementary schools (students ages 4–12 years). Schools were situated in the country as well as in and around two cities (more than 150,000 citizens) in the Netherlands. The 32 schools differed largely by background characteristics (denomination, number of students and teachers, percentage of students with a low socioeconomic status) and are comparable to other schools in the country and cities (see Table 1).

School boards in this study recommended that their schools participate in the survey so that their schools would get more insight into their capacity to improve teaching and learning.

All of the teachers in these schools participated in the survey. The questionnaire was submitted to 613 teachers, of whom 502 returned the questionnaire, for a response rate of 81.9%. Nonresponse of teachers was related to long illness or absence during pregnancy. Background information on teachers and schools was provided by the administration office of the school boards

and items in the questionnaire. Of the teachers responding to the survey, 20% were male and 80% were female. Furthermore teachers differed in their appointment (ranging from half day to full-time) and their years of experience in elementary education (ranging from less than half a year to more than 45 years) and at their school (ranging from 1 month to more than 45 years).

Measures

The concepts in this study were operationalized and measured using existing scales and items on teaching practices (Geijsel, 2001; Roelofs & Houtveen, 1999; van Zoelen & Houtveen, 2000), teacher engagement in professional learning activities (Geijsel, 2001; Kwakman, 2003), teacher motivation (Huber & Rollinger-Doyen, 1989; Leithwood, Dart, Jantzi, & Steinbach, 1993; Seegers, van Putten, & de Brabander, 2002; van Woerkom, 2003), school organizational conditions (Consortium on Chicago School Research, 2005; Geijsel, 2001; Jongmans et al., 2004; Little, 1990), and transformational school leadership (Geijsel, 2001; Leithwood et al., 1993; Silins, 1994) as well as newly formulated items. Items originally in English were carefully translated and adjusted for appropriateness within the Dutch context. All items were included in a revised version of the Dutch School Improvement Questionnaire for teachers. Teachers indicated the extent to which the item content applied to them on 4-point scales (1 = *does apply to me [almost] never*, 2 = *does apply to me sometimes*, 3 = *does apply to me often*, 4 = *does apply to me [almost] always*).

Originally, the questionnaire contained 107 items. We performed principal component analyses and item analyses that resulted in a selection of 100 items distributed over 16 scales, as can be found in Appendix A (4 to 6 items per scale; Cronbach's $\alpha = .70–.90$). We then constructed the measurement model that provided a good fit to the data (maximum likelihood estimation), $\chi^2(3707) = 6073.071$, $p = .00$; root mean square error of approximation (RMSEA) = .036 (.034, .038), standardized root mean square residual (SRMR) = .052. The proportion of explained variance for the individual items ranged from .12 to .72. On the basis of the results of the measurement model, scales were constructed by averaging the item scores if at least 80% of the items were completed.

Analyses

The relationships among the variables depicted in Figure 1 and the related hypotheses were investigated through structural equation modeling, using the computer program Mplus 3 (Muthén & Muthén, 2004). In all models

we also included teachers' gender and professional experience in elementary education as control variables. We controlled for gender and professional experience in elementary education by having direct effects on all other variables in the model. Possible dependence between teachers from the same schools was taken into account by applying the Mplus complex sampling option, obtaining maximum likelihood estimates with robust standard errors and a robust chi-square measure of overall goodness of fit (Yuan & Bentler, 2000). In addition, we also report the associated RMSEA, the comparative fit index (CFI; Hu & Bentler, 1999), and the SRMR. The fit of the model is considered acceptable when SRMR is less than or equal to .08, RMSEA is less than or equal to .06, and CFI is greater than .95 (Hu & Bentler, 1999). We compared nested models by using the Satorra-Bentler scaled chi-square difference test ($\Delta\chi^2_{SB}$; Satorra-Bentler, 2001) with degrees of freedom (*df*) equal to the difference in numbers of parameters that are free to be estimated. If appropriate, model modifications were carried out on the basis of standardized residuals and modification indices.

Results

The path model as presented in Figure 1 and the related hypotheses, with the addition of the teacher background characteristics gender and professional experience in elementary education, were fit to the data. Our model featured causal relationships; however, since the model is fit to correlational data, causality cannot be established even if our model fits. Maximum likelihood robust estimation of Model 1 yielded a χ^2 of 301.90 ($df = 62$, $p = .00$), RMSEA of .089, SRMR of .098, and CFI of .829. This means that our Model 1 did not fit well. Based on modification indices and standardized residuals, we stepwise added effects of trust on collaboration among teachers and collaboration among teachers on participative decision making and added the correlation between the two professional learning activities. This resulted in a Model 2 that fit the data well, $\chi^2(59) = 146.70$, $p = .00$; RMSEA = .055, SRMR = .067, CFI = .937. The model fit of our model improved significantly, $\Delta\chi^2_{SB}(3) = 247.37$, $p = .00$.

Model 2 has a very large number of regression effects. To get a clearer picture of the most important direct and indirect effects, we removed nonsignificant effects of dimensions of transformational leadership from Model 2. Stepwise removing these nonsignificant paths yielded Model 3. This Model 3 fit the data as well as Model 2, $\chi^2(77) = 167.17$, $p = .00$; RMSEA = .049, SRMR = .075, CFI = .936; $\Delta\chi^2_{SB}(18) = -14.96$, $p = .66$. Standardized regression coefficients of this final Model 3 are presented in Figure 2; correlations among the factors are presented in Appendix B. To facilitate interpretation, all direct, indirect, and total effects on teaching practices are presented in Table 2.

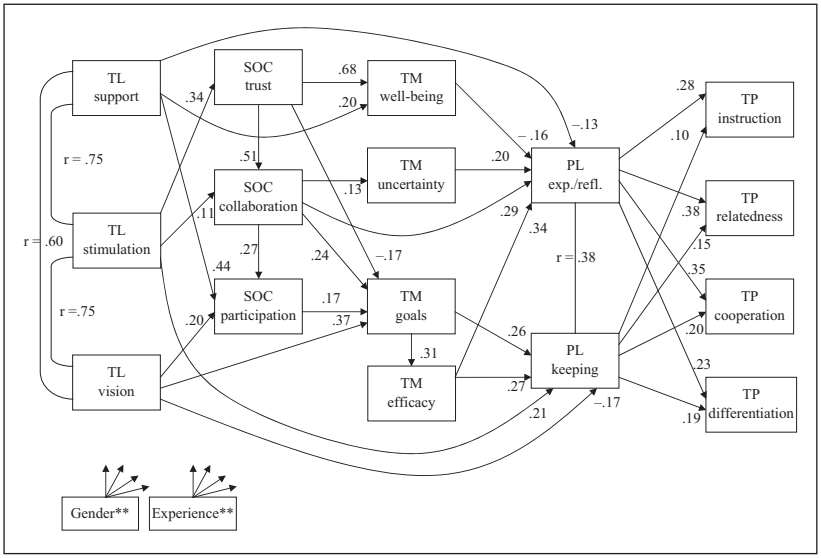

Figure 2. Completely standardized solution for the path analysis of teaching practices explained by professional learning, teacher motivational factors, school organizational conditions and transformational leadership practices, controlled for gender and years of experience

Note: TL = transformational leadership; SOC = school organizational conditions; TM = teacher motivation; PL = professional learning; TP = teaching practices.

*For the ease of exposition, only significant effects are depicted ($p < .05$).

**Teacher background characteristics have a direct effect on all other variables.

Results of the final structural Model 3 showed that teachers' engagement in professional learning activities explains teaching practices (Hypothesis 1). More specific, the results in Table 2 show that the quality of instruction is more affected by teachers' engagement in experimenting and reflection than by the extent to which teachers read professional literature (keeping up to date). Furthermore, the findings showed that process-oriented instruction and differentiation among students were less explained (10.6% and 12.0%, respectively) by the factors in our model than the extent to which these factors explained variance in relatedness to students' world and cooperative learning (20.2% and 22.0%, respectively). According to Cohen's f^2, these percentages can be considered medium and large effects. The addition of teacher background characteristics to our model to control for gender and professional experience in elementary education showed that teachers' professional experience in elementary education played a significant role in

Table 2. Standardized Direct, Indirect, and Total Effects for Explanatory Variables on Teaching Practices

	Teaching practices											
	Effects on process-oriented instruction			Effects on relatedness to student's world			Effects on cooperative learning			Effects on differentiation		
	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total
Professional learning												
Keeping up-to-date	.10		.10	.15		.15	.20		.20	.19		.19
Experimenting and reflection	.28		.28	.38		.38	.35		.35	.23		.23
Teacher motivation												
Efficacy		.12	.12		.17	.17		.17	.17		.13	.13
Personal goals		.06	.06		.09	.09		.10	.10		.09	.09
Tolerance of uncertainty		.06	.06		.08	.08		.07	.07		.05	.05
Well-being		−.04	−.04		−.06	−.06		−.06	−.06		−.04	−.04
School organizational conditions												
Collaboration		.11	.11		.15	.15		.14	.14		.10	.10
Participative decision making		.02	.02		.03	.03		.03	.03		.02	.02
Trust		.02	.02		.02	.02		.02	.02		.02	.02
Transformational leadership												
Vision		.00	.00		−.01	−.01		−.02	−.02		−.02	−.02
Individual consideration		−.04	−.04		−.06	−.06		−.05	−.05		−.03	−.03
Intellectual stimulation		.03	.03		.05	.05		.06	.06		.05	.05
Teacher background characteristics												
Gender	*−.04*	*.03*	*−.01*	*.01*	*−.05*	*−.04*	*−.07*	*−.03*	*−.10*	*−.00*	*.04*	*.04*
Professional experience in education	*.08*	*−.04*	*.04*	.12	.06	.18	.14	.13	.27	.10	−.01	.09
Percentage of explained variance	10.6			20.2			22.0			12.0		

Note: $N = 493$. Robust $\chi^2 = 167.171$, $df = 77$, root mean square error of approximation = .049, comparative fit index = .936, standardized root mean square residual = .075. All direct effects are significant at $p < .05$, except figures in italics.

explaining teaching practices. More experienced teachers seemed to show more constructivist teaching practices.

With respect to the effect of teacher motivational factors on teaching practices, the results in Figure 2 show that this relation is mediated by teachers' engagement in professional learning activities (Hypothesis 2). More specifically, sense of self-efficacy (the expectancy component) seemed to influence engagement in professional learning activities. For example, the standardized effect of teachers' sense of self-efficacy on their engagement in activities for keeping up to date is .27, as the results in Figure 2 show. This implies that a 1 standard deviation difference between teachers on the engagement in activities for keeping up to date is associated with a .27 standard deviation difference on sense of self-efficacy. When teachers believe stronger in their capabilities to achieve a desired result, they are more engaged in professional learning activities. Furthermore, a direct effect of teachers' internalization of school goals into personal goals (the value component) on keeping up to date was found (.26). The more teachers internalized the school goals into personal goals, the more they were engaged in keeping up to date. A significant relationship between teachers' internalization of school goals into personal goals and experimenting and reflection was not found, which was somewhat different from we predicted. Moreover, an indirect effect of teachers' internalization of school goals into on experimenting and reflection via teachers' sense of self-efficacy was found. With respect to the affective component of teacher motivation, including teachers' feelings of uncertainty and well-being, the results show only direct effects of these factors on teachers' engagement in experimenting and reflection. In contrast to our expectations, we found a negative direct effect of teachers' well-being on experimenting and reflection (–.16). The more teachers feel well, the less they experiment with new things and reflect on their practice. With regard to the influence of teachers' motivation on their engagement in professional learning activities, teachers' sense of self-efficacy and their internalization of school goals into personal goals appeared to be the most important explanatory motivational factors in our model.

Besides motivational factors, collaboration among teachers appeared to have a direct effect on one of the professional learning activities: experimenting and reflection (.29; Hypothesis 3). The more teachers collaborated, the more they were engaged in experimenting and reflection. Although not expected, we also found indirect effects of teacher collaboration on teachers' engagement in professional learning activities, as the results in Figure 2 show. The more teachers collaborated, the more they internalized organizational goals and the more they had a tolerance for uncertain situations, which in turn seemed to lead to a greater engagement in professional learning activities. The findings also revealed that collaboration among teachers seems to influence participative

decision making: Teacher collaboration seemed to lead to more participation of teachers in decision-making processes.

With respect to participative decision making, a relation with teachers' internalization of school goals into personal goals (.17; see Figure 2) was found (Hypothesis 4). The more teachers participated in decision-making processes, the more they seemed to internalize school goals into personal goals. In contrast to our expectation, we did not find direct effects of participative decision making on self-efficacy. The hypothesized effects on trust were only partly confirmed. In contrast to what we expected, no direct effects of trust on teachers' engagement in professional learning activities were found (Hypothesis 5). These findings suggest that teachers are not more engaged in professional learning activities when they perceive a climate of trust. Furthermore, trust appeared to have a direct *negative* effect on teachers' internalization of school goals into personal goals (Hypothesis 6). The more teachers perceive a climate of trust, the less they internalize school goals into personal goals. In accordance with what we expected, the findings also showed that trust had a positive direct effect on teacher well-being (.68; Hypothesis 6). Teachers who perceive a stronger climate of trust seem to have more positive feelings of well-being. Finally, the findings also revealed that a climate of trust can stimulate teacher collaboration, an effect we did not predict.

With regard to transformational leadership practices, direct effects of all the three dimensions on teachers' engagement in professional learning activities were found, as the results in Figure 2 show (Hypothesis 7). The findings clearly showed that vision building and intellectual stimulation seemed to influence keeping up to date. Encouraging teachers to question their own beliefs, assumptions, and values seemed to increase the extent to which teachers read professional literature and kept themselves informed about changes affecting their work (.21). Vision building on the other hand seemed to decrease the extent to which teachers kept themselves up to date (–.17). This adverse effect of vision building is somewhat remarkable. In addition, the results showed that the other dimension of transformational leadership, individualized consideration and support, had a negative small direct effect on experimenting and reflection (–.13). More support and consideration seems to inhibit teachers' engagement in professional learning activities. In addition to these direct effects of transformational leadership on teachers' engagement in professional learning activities, differential meditational effects were found (Hypotheses 8 and 9). Vision appeared to have both a direct effect on teacher motivation as well as an indirect effect via participative decision making. The more a school leader initiated and identified a vision, the more teachers internalized the school's goals (.37). Individual support and consideration, another dimension of transformational leadership, also appeared to affect

teacher motivation indirectly via participative decision making and teachers' well-being. Furthermore, individualized support and consideration also appeared to have a small direct effect on the affective component of teacher motivation, teachers' well-being (.20). More support and consideration seems to stimulate teachers' well-being. Finally, intellectual stimulation appeared to affect both the affective (tolerance for uncertainty) and value components (internalization of school goals into personal goals) of teacher motivation indirectly via teacher collaboration and trust. The more school leaders encourage teachers to reflect on their assumptions, beliefs, and values, the more teachers perceive a climate of trust and the more they collaborate, which, in turn, leads to more motivated teachers.

As for the teacher background characteristics, our results show different effects of teacher background characteristics on the other variables. In addition to the significant relation between teachers' professional experience in elementary education and their teaching practices, the results show that experience in elementary education is positively associated with the engagement in activities for keeping up to date and the internalization of school goals. The more experience in elementary education teachers have, the more they seemed to keep themselves up to date and the more they internalized school goals. On the other hand, more experienced teachers seemed to engage less in experimenting and reflection activities and had fewer feelings of uncertainty. With respect to gender, our results show that female teachers were more engaged in experimenting and reflection, had more internalized school goals, and experienced more collaboration among teachers but perceived less support and consideration from their school leader than male teachers do. Altogether the results indicate teachers' engagement in experimenting and reflection is a strong predictor for explaining the extent to which teachers create teacher practices that are based on constructivist approaches to teaching. The results also reveal the interplay among motivational factors, school organizational conditions, and transformational leadership practices for teachers' professional learning and teaching practices. Given the importance of teachers' motivation for their engagement in professional learning activities, our results suggest that showing transformational leadership practices and stimulating collaboration and shared decision making are important tools through which school leaders can enhance teachers' professional learning and teacher practices to ensure quality schooling.

Conclusions and Discussion

In this study, we examined the relative importance of teachers' engagement in professional learning activities, teacher motivational factors, school organizational conditions, and transformational leadership practices in explaining variation

in instructional strategies teachers use in their classroom. Based on constructivist approaches to teaching, we distinguished four instructional strategies: process-oriented instruction, relatedness to the students' world, cooperative learning, and differentiation. We used theories of adult learning and change within organizations, theories on motivation, and research on transformational leadership to hypothesize relations among dimensions of transformational leadership (vision, individual consideration, and intellectual stimulation), school organizational conditions (participative decision making, collaboration among teachers, and trust), teacher motivational factors (teachers' sense of self-efficacy, the internalization of school goals into personal goals, tolerance of uncertainty, and well-being), teachers' engagement in professional learning activities (keeping up to date, and experimenting and reflection), and the instructional strategies teachers use. We tested a structural model with a sample of data from 502 teachers at 32 Dutch elementary schools. In this section, we discuss our most important findings.

First, our data offer support for our assumption that teachers who are more engaged in professional learning activities to improve their practice will have better teaching practices in terms of the quality of instruction. On average, the more teachers engage in professional learning activities, the more teachers use instructional strategies that facilitate situated, social, and differentiated learning. Moreover, the findings suggest that experimenting and reflection are more powerful predictors for teaching practices than keeping up to date.

Motivational factors, including expectancy, value, and affective components, appeared to have differential effects on teachers' engagement in professional learning activities. Most of the variance in teachers' engagement in professional learning activities is explained by the expectancy component of teacher motivation: teachers' sense of self-efficacy. Teachers' sense of self-efficacy appears to be the most important motivational factor for explaining teacher learning and teaching practices. This result concurs with findings of earlier studies into the role of teachers' sense of self-efficacy for teacher learning and educational change (Bandura, 1993; Geijsel et al., 2009).

Next to teachers' sense of self-efficacy, the findings also showed that effects of the value (teachers' internalization of school goals into personal goals) and affective components of motivation (well-being and feelings of uncertainty) on teachers' engagement in professional learning activities differ. The findings suggest that internalization of school goals into personal goals mainly influences the extent to which teachers keep themselves up to date. As mentioned earlier, we considered teacher commitment as a key element of the value component of motivation. Committed teachers often feel a strong moral responsibility to improve the quality and performance of their organization by making an effort to put the organizational goals and values into their classroom practice. When their current classroom practice differs from the desired

practice as envisioned in their personal goals, committed teachers may feel a need to be informed about new developments and to engage in more formal professional learning activities (training, courses, etc.). By engaging in training and by reading professional literature, they will be stimulated to improve their teaching according to their personal values and goals and those of their organization. So the results of our study confirm the important role of teacher commitment as an element of teacher motivation for professional learning.

Teachers' emotions seem to play a different role for promoting professional learning and improving teaching practice. Our findings offer support for the idea that uncertain teachers are more prone to working in a routine way, avoiding risks, whereas more certain teachers are more flexible in their approaches. We also found that a concern for well-being can inhibit the engagement in experimenting and reflection activities. Teacher well-being has been related to job satisfaction, and studies indicate that teachers' satisfaction is associated with aspects such as workplace conditions and organizational culture (Certo & Fox, 2002). One possible explanation could be that teachers who are satisfied with their own teaching practice feel less need to reflect on their practice and try new things out than teachers who are less satisfied with the quality of their instruction. Moreover, they also might interpret external reform initiatives and related expectations as corresponding with their own beliefs about learning and instruction, their perceived capacities, and their current teaching practice. As a consequence, they do not feel a sense of urgency to professionalize themselves (Coburn, 2001). So satisfied teachers may lack the motivation for change and thus may be not willing to improve their classroom practice.

Next to the direct effects of motivation on teachers' engagement in professional learning activities, the different components also mediate the effects of school organizational conditions and leadership practices on professional learning and teaching practices. Of all the components of motivation, the value component (internalization of school goals into personal goals) seems to play a central role in mediating the effects of leadership practices and school organizational conditions on teachers' sense of self-efficacy and the engagement in professional learning activities. These findings confirm results of previous studies (Geijsel et al., 2003; Geijsel et al., 2009; Leithwood et al., 1999) and emphasize the key role teacher commitment plays in building schoolwide capacity for teacher learning.

Previous studies into schools as professionals communities have shown that organizational factors such as teacher interactions and cooperation, participative decision making, and a climate of trust can foster teachers' professional learning in schools (Bryk et al., 1999; Kwakman, 2003; Leithwood et al., 1999; Tschannen-Moran & Hoy, 1998; van Woerkom et al., 2002). Our results confirm the positive effects of collaboration, as one of the key dimensions of a professional learning community, on teacher motivation and teacher professionalism.

Collaboration provides opportunities for teachers to work together to solve problems and to provide feedback and information. This stimulates the extent to which teachers experiment in their classroom with new materials, try out new things and reflect on their current teaching, leading to better instruction. Collaboration provides support and assistance and thus may stimulate a professional culture in which teachers are more willing to put forward effort in contributing to their organization, which will in turn reduce their feelings of uncertainty.

Our findings also suggest that trust can strongly affect teachers' well-being and can facilitate teacher collaboration. These findings confirm results of earlier studies (Tschannen-Moran & Hoy, 1998). Furthermore, it appeared that trust also had, although small, negative effects on teacher motivation and professional learning. One explanation for these negative effects could be that the relation between trust and teacher motivation is curvilinear or that trust moderates the effects of organizational factors and leadership practices on teacher motivation. In these cases too much trust might be counterproductive for teacher motivation and teacher professionalism. In future research more attention should be paid to the possible drawbacks of trust in schools.

Finally, transformational leadership practices seem to have an important facilitating role in fostering conditions for school improvement. On average, dimensions of transformational leadership stimulate teachers' engagement in professional learning activities as well as their motivation and can improve school organizational working conditions.

In accordance with our expectations, transformational school leadership practices stimulate teachers to engage in professional learning activities. Stimulating teachers to professionalize themselves positively affects teachers' engagement in activities for keeping up to date. The provision of financing, time, and space, thus, enhances the extent to which teachers collect new knowledge and keep up to date with new insights and developments. However, although findings of this study support the claim that school leaders make modest contributions to staff capacities and performance (e.g., Leithwood et al., 2008; Leithwood & Jantzi, 2006; Mascall & Leithwood, 2008), two dimensions of transformational school leadership seem to be counterproductive for teachers' professional learning. Processes of vision building decrease teachers' engagement in activities for keeping up to date, and individualized consideration and support harms the engagement of teachers in experimenting and reflection activities. An explanation for the adverse effect of vision may be that principals identify new avenues for future actions but do not involve teachers in the process of vision building. As a consequence, teachers do not feel responsible for formulating and developing a school vision and keeping themselves up to date on new insights and developments with respect to the process of vision building. So when principals do not consider teachers as co-constructers in the process of vision building, teachers might also feel

less eager to collect new information, insights, and developments from different sources to strengthen their knowledge base.

With respect to individualized consideration and support, teachers' feelings, opinions, and needs can be rather different from or even hinder the direction of change and organizational goals. Showing concern and respect of school leaders for teachers' emotions may be interpreted by teachers as tacit agreement of current classroom practice and, therefore, may discourage teachers from engaging in experimenting and reflection activities.

The influence of transformational leadership practices on teachers' professional learning seems to be mediated by teacher motivation. As in other studies (e.g., Geijsel et al., 2003; Leithwood et al., 1999; Nguni et al., 2006), our results confirm the significant role of transformational leadership for teacher motivation and extra effort. Moreover, the findings suggest that the two dimensions of transformational leadership, vision building and support, differ in the way they affect different components of motivation. By initiating and identifying a vision, school leaders reinforce the personal and social identification of followers with the organization and thus increase collective cohesion. As a consequence, teachers may feel more committed and are more willing to internalize organizational goals and values as their personal goals. Vision thus plays an important role in stimulating the value component of teacher motivation. Individual support or consideration on the other hand represents an attempt to understand, recognize, and satisfy followers' concerns and needs while treating each follower uniquely. Individual support may therefore reduce teachers' concern for well-being and help them to elevate their personal potential. So by acting as a role model, coaching, and providing feedback, school leaders can thus help to reduce teachers' feelings of uncertainty and vulnerability.

Like Dionne et al. (2004) proposed in their model, our findings also show that dimensions of transformational leadership improve teamwork processes and school organizational conditions such as participation in decision making, teacher collaboration, and relational trust. These findings confirm results of earlier studies (Leithwood & Sun, 2009; Mulford & Silins, 2003; Sleegers et al., 2002). Also in this case, it appeared that different dimensions of transformational leadership affected different school organizational factors. Vision building and individual support were related to teacher participation in decision making. By initiating a shared vision and providing support, school leaders may help to link teachers' current needs to the school's goals, to produce a shared vision, and to increase collective cohesion. These transformational leadership practices can thus stimulate teachers' participation in decision making and promote teacher empowerment. With regard to the other dimension of transformational leadership, intellectual stimulation, the findings suggest that this leadership practice can foster collaboration and a climate of trust. Through intellectual stimulation, transformational school leaders encourage teachers to question their own

beliefs, assumptions, and values and enhance teachers' ability to solve individual, group, and organizational problems. Furthermore, intellectual stimulation can also make teachers believe that improving the quality of education is both an individual and collective enterprise. As a consequence, teachers are more willing to invest their energy in continuous professional learning.

Altogether these results indicate that, to be effective, school leaders need to use a combination of transformational leadership behaviors to improve teaching and learning. Further research is needed to examine how transformational leadership supports teachers in creating teaching practices that matter. Although the importance of transformational leadership for reform-oriented school improvement is widely acknowledged, studies have not shown strong effects of transformational leadership on student achievement, especially when these effects are compared to the effects of instructional leadership on student outcomes (Leithwood & Sun, 2009; Robinson, Lloyd, & Rowe, 2008; Sleegers et al., 2002). To increase our understanding of the complex paths through which school leaders have an impact on school effectiveness and school improvement, more integrated models, in which transformational leadership and instructional leadership coexist, are needed to assess the impact of leadership practices on school effectiveness and school improvement (Hallinger, 2003; Marks & Printy, 2003). We therefore agree with the argument that researchers should focus more on the impact particular leadership practices, including transformational ones, have on teaching and learning than on the effects of instructional, transformational, and other types of leadership (Leithwood et al., 2008; Robinson et al., 2008).

Limitations and Future Directions

The present study contributes to the development and understanding of models needed to understand how leadership, organizational design, and teacher psychological states influence teacher learning and teaching practices, as has been requested by scholars for a long time (Richardson & Placier, 2001; Rosenholtz, 1991; Smylie, 1988).

In the present study we used a model of leadership and school organizational and motivational factors to explain variance in the quality of teachers' teaching. Although we used a large sample of teachers, a relatively small amount of variance in teaching practices was explained. Relatedness to students' world and cooperative learning explained about 20% of the variance; process-oriented instruction and differentiated learning explained about 10% of the variance. We therefore expect that other factors not included in our model may affect the quality of instruction. Future research should also include contextual factors such as the particular mix of students (class size, age, and ethnic, social, and cultural background), school history, availability of resources, and

the local and broader community (parents' expectations, governmental policy; Leithwood & Jantzi, 2006; Stoll, 1999).

A possible limitation of our study is that we used perceptions of teachers to measure teaching practices. Although teacher reports are sometimes considered to be biased by self-serving strategies or teaching ideals, student ratings are occasionally criticized as being undifferentiated and easily influenced by personal preferences. An examination by Kunter and Baumert (2006) of the construct and criteria validity of student and teacher ratings as indicators of teacher instruction showed that student and teacher ratings are best suited to tapping different aspects of the learning environment. Both perspectives seem to provide valuable insights into classroom management issues and can perhaps be used interchangeably. In future research, next to teachers' perceptions of their teaching, researchers should also pay attention to students' perceptions of the quality of teachers' teaching.

In the present study we examined the contribution of leadership and organizational and motivational factors to teachers' engagement in professional learning activities and their teaching practices *at one point in time.* Similar to our study, the bulk of quantitative research on school improvement consists of cross-sectional surveys that provide one-point-in-time "snapshots" that are unable to shed light on the nature of school improvement. To describe and understand the nature of organizational changes, scholarship requires both dynamic theories of organizational processes and sociocultural interactions and dynamic methods that can model changes in an organization's capacities and growth. Future studies should investigate conditions for school improvement *over a period of time* because this approach to organizational analysis assumes that the development of conditions for school improvement and their subsequent effects on the quality of teaching are dynamic and changing rather than static.

Finally, efforts to improve teachers' teaching should foster student learning. Past research suggests differences in teachers' impact on student learning (Bembry & Schumacker, 2002; Brophy & Good, 1986; Cohen & Hill, 2000; Hanushek, 1997; Rivkin, Hanushek, & Kain, 2000; Rowan, Correnti, & Miller, 2002; Rowe & Hill, 1998; Sanders & Horn, 1998; Wright, Horn, & Sanders, 1997). It is less clear how various internal school conditions interact with instructional strategies teachers use to affect student learning as well as the extent to which teaching effects persist over time (McCaffrey, Lockwood, Koretz, & Hamilton, 2003). Despite different claims of the impact of professional learning communities on student learning, more research is needed to identify organizational conditions and psychological factors that contribute to differences in teaching effects on student learning and whether these effects persist over time (Hamilton, Klein, & McCaffrey, 2001; Kupermintz, 2003; McCaffrey et al., 2003).

Appendix A

Overview of Scaled Variables

Components	Example item	Items	α
Transformational leadership (TL)			
Vision (TL vision)	Makes use of all possible opportunities to communicate the school's vision to the team, the pupils, parents and others.	5	.88
Individualized consideration (TL support)	Shows appreciation when a teacher takes the initiative to improve teaching in the school or to engage in other forms of professional development.	4	.91
Intellectual stimulation (TL stimulation)	Encourages teachers to seek and discuss new information and ideas that are relevant to the direction in which the school is developing.	8	.92
School organizational conditions (SOC)			
Participative decision making (SOC participation)	Teachers at our school take decisions about coordinating the curriculum over the different school years together.	8	.89
Collaboration among teachers (SOC collaboration)	My colleagues give me support when I try out new teaching methods.	7	.82
Trust (SOC trust)	Teachers in this school are open with each other.	6	.89
Teacher motivation (TM)			
Internalization of school goals (TM goals)	I have noticed that I am expanding my own repertoire as a teacher in order to put the school's vision into practice.	5	.82
Teacher efficacy (TM efficacy)	I'm satisfied with the quality of my work.	5	.81
Tolerance of uncertainty (TM uncertainty)	I gladly try out new things, even if it produces nothing.	5	.75
Well-being (TM well-being)	I am settled in this school.	6	.86

(continued)

Appendix A (continued)

Components	Example item	Items	α
Professional learning activities (PL)			
Keeping up-to-date (PL keeping)	I take part in further training and in-service training even if it is not compulsory.	5	.79
Experimenting and reflection (PL exp./ref.)	I try out new knowledge and skills in my lessons. I discuss problems in my classroom teaching with others in order to learn from them.	7	.79
Teaching practices (TP)			
Process-oriented instruction (TP instruction)	I ask students how they arrived at a solution, and what the steps in their thought processes were.	6	.76
Connection to students' word (TP connection)	I adapt the content of my lessons as much as possible to the students' perceptions of their environment.	3	.73
Cooperative learning (TP cooperation)	In the event of group assignments, I assign students to come up with a joint result.	4	.76
Differentiation (TP differentiation)	If more talented students are ready, I give them additional subject matter that connects to the basic subject matter.	5	.72

Appendix B

Correlations Among Factors in the Final Measurement Model

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Transformational leadership																
1. Vision	1															
2. Support	.60	1														
3. Stimulation	.65	.75	1													
School organizational conditions																
4. Collaboration	.25	.19	.29	1												
5. Participative decision making	.53	.61	.57	.39	1											
6. Trust	.30	.31	.34	.56	.43	1										
Teacher motivation																
7. Efficacy	.17	.17	.21	.19	.24	.13	1									
8. Personal goals	.47	.28	.29	.29	.39	.15	.34	1								
9. Tolerance of uncertainty	.13	.13	.15	.16	.20	.14	.17	.16	1							
10. Well-being	.33	.41	.41	.51	.49	.74	.26	.23	.17	1						
Professional learning																
11. Keeping up-to-date	.13	.15	.24	.16	.27	.12	.38	.35	.20	.11	1					
12. Experimentation and reflection	.05	–.03	.09	.34	.10	.11	.39	.25	.35	.09	.38	1				
Teaching practices																
13. Process-oriented instruction	.10	.10	.17	.18	.14	.21	.33	.21	.13	.17	.23	.30	1			
14. Relatedness	.15	.12	.21	.22	.17	.12	.38	.31	.15	.11	.31	.41	.42	1		
15. Cooperative learning	.08	.04	.18	.25	.15	.25	.28	.27	.17	.18	.36	.40	.46	.44	1	
16. Differentiation	.14	.12	.22	.19	.20	.16	.32	.30	.03	.11	.29	.27	.36	.37	.40	1

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