

MASTER THESIS

Teachers' professional learning:
researching the influence of collective
leadership practices and the mediating
role of teacher self-efficacy

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ABSTRACT

Purpose: In order to reach the new educational goals, professional learning of teachers is becoming more important. Teachers' engagement in individual and social learning in the workplace is essential to adapt effectively to the changes needed. This study examines the extent to which collective leadership practices affect professional learning of teachers, as mediated by teacher self-efficacy. More specifically, how teachers' participation in the learning activities keeping up-to-date, experimenting and reflection and information sharing and asking for feedback is influenced by teacher self-efficacy and the leadership practices setting directions, developing people, redesigning the organization and improving the instructional program. **Research design:** The data was collected by use of a survey and in total, 127 teachers of ten elementary schools in the Netherlands participated in the research. **Findings:** Results showed that collective leadership practices affected teachers' engagement in the social learning activity information sharing and asking for feedback. Furthermore, the leadership practices positively influenced teacher self-efficacy. Teachers' self-efficacy beliefs directly and positively influenced the individual and social learning activities. Finally, teacher self-efficacy partly mediated the effect of collective leadership practices on information sharing and asking for feedback. **Conclusion:** Leadership practices can enhance teacher self-efficacy and stimulate teachers' engagement in social learning activities. Teacher self-efficacy is a mediating variable in the influence of leadership practices on social learning, which indicates that teachers, who perceive more collective leadership practices, have more self-efficacy beliefs, which enhances the sharing of information with and asking for feedback from colleagues.

Key words: teacher learning, collective leadership, leadership practices, teacher self-efficacy

FOREWORD

This master thesis is the result of my Final Project for the master Educational Science and Technology at the University of Twente. The Final Project is conducted on behalf of Codenz, a foundation consisting of ten elementary schools in the Netherlands. The goal of this Final Project is to investigate professional learning of teachers.

First of all, I want to express my thanks to my supervisors of the University of Twente. Maria Hendriks, special thanks to you for your professional and encouraging supervision. Your knowledge, feedback and enthusiasm stimulated me during the process. Tim Hirschler and Peter Slegers, thank you for your helpful feedback. Marijn Wijga, thanks for helping me out when I got lost in my data analysis.

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You are great and I could not have done this without you!

Corike van de Merwe

FIND YOUR GREATNESS

Somehow we've come to believe that greatness is only for the chosen few, for the superstars. The truth is, greatness is for us all. This is not about lowering expectations; it's about raising them for every last one of us. Greatness is not in one special place, and it's not in one special person. Greatness is wherever someone is trying to find it.

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Nowadays, the Dutch economy is a learning economy. A learning economy is determined by the knowledge of people and creates new expectations for people. In a learning economy, people are expected to adapt to complex challenges and new situations and to acquire new competences quickly to keep up-to-date with new social and technological developments (Ministry of Education, Culture and Science, 2014).

The Dutch learning economy places new demands on education, not only on higher education, but also on elementary education. Students in elementary education have to be prepared for functioning in this learning economy of the future. This is a challenging task. In the future economy, an increased number of occupations will involve complex problem solving and creative thinking as well as complex social interactions. This requires deliberate effort from schools to cultivate students in 21st century skills and competencies, such as creativity, critical thinking, communication and collaboration. Currently, Dutch elementary education is of high quality, however, elementary education should respond more to 21st century needs. In the future, fundamental knowledge and skills are still important. However, two other goals of education are important as well: these are personal development and preparation of students for participation in the Dutch society (citizenship). To reach these educational goals, teachers should motivate students to become flexible, responsible and social and prepare them for lifelong learning (Ministry of Education, Culture and Science, 2016).

Promoting these new educational goals requires new ways of teaching and learning. Teachers have to fulfil a new role in which they create motivating learning environments and facilitate student learning. In addition, teaching approaches should be more adaptive to the interests of the students and further education and better connected to the environment outside the school (Ministry of Education, Culture and Science, 2016). Schools will obtain more autonomy with regard to the learning content. Beside the

mandatory subjects, teachers have the opportunity to select subjects for the curriculum that suit the school and the students. This integrated approach enhances teacher collaboration in schools and makes learning more meaningful to students. Teachers are important in reaching the new educational goals. They have to be able to determine the learning content for the students, in cooperation with the school leader. This requires educational knowledge, leadership and collaboration within teacher teams. Teachers have to connect with other professionals inside and outside the school to work on a coherent curriculum and to share pedagogical and didactical knowledge.

The notion of Education 2032 is that collaboration in teams and engagement in both individual and social professional learning in the workplace are essential to adapt effectively to the changes needed. Schools should become learning organisations. Teacher learning in the workplace, in which teachers have an active role and the content of learning is determined by the challenges of the work itself, enables teachers to find solutions that are tailored to their specific circumstances. It also allows them to maintain high levels of teaching in a changing environment where solutions that were once found expire (Korthagen & Vasalos, 2005; van Woerkom, 2003). Therefore, this study focuses on teacher learning in the workplace that is regarded as an expected component of professional learning activities of teachers and is seen as: "... an active and constructive process that is problem oriented, grounded in social settings and circumstances, and takes place throughout adults' lives" (Desimone, 2009; Slegers, Bolhuis & Geijsel, 2005; Geijsel, Slegers, Stoel & Krüger, 2009).

Codenz, a foundation consisting of ten elementary schools in two municipalities in the Netherlands, acknowledges the importance of teacher learning in the workplace for teachers' professional learning and school improvement. However, knowledge is lacking about how to foster and stimulate teachers' professional learning in the workplace.

Findings from earlier research have suggested that transformational leadership practices, school organizational conditions and psychological factors can stimulate teachers' participation in individual and social learning activities (Geijsel et al., 2009; Kwakman, 2003, Oude Groote Beverborg, 2015; Thoonen, Slegers, Oort, Peetsma & Geijsel, 2011). These studies focused on organizational conditions like transformational leadership and collaboration among teachers, as well as psychological factors like self-efficacy beliefs, in enhancing individual and social learning. Moreover, earlier research shows that these variables interact to create a supportive environment for learning: the influence of transformational leadership practices on teacher learning seems to be mediated by teachers' perceptions of the workplace and psychological factors (Geijsel et al., 2009; Kwakman, 2003; Leithwood, Jantzi & Mascall, 2002; Runhaar, 2008; Thoonen et al., 2011).

Two types of leadership are frequently studied in research on teacher learning; transformational leadership and instructional leadership. Both types of leadership include practices that are regarded essential for teacher learning and school improvement. Leithwood, Harris and Hopkins (2008), Robinson, Lloyd and Rowe (2008) and Thoonen et al. (2011) argue for research in which transformational and instructional leadership practices coexist. Systematic knowledge about how these generic leadership practices affect teacher learning is largely lacking. Therefore, this study examines the influence of four categories of generic leadership practices: setting directions, developing people, redesigning the organization and improving the instructional program (Leithwood et al., 2008).

Earlier research into the influence of school leadership on teacher learning focused on leadership practices of the school leader (Geijsel et al., 2009; Thoonen et al., 2011). Other research examined the combined effects of more sources of leadership, referred to as 'collective leadership' (Leithwood & Mascall, 2008). Leithwood and Mascall (2008) found effects of collective leadership on teacher capacity, teacher motivation, teachers' work setting and student achievement. However, little empirical evidence about the influence of collective leadership on teachers'

professional learning is present. Therefore, this study uses the concept of collective leadership to examine the combined influence of leadership of more sources of leadership.

The psychological factor 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" (Thoonen et al., 2011, p. 504). Self-efficacy beliefs are important as higher levels of self-efficacy motivate people to spend more effort and to persist in spending effort, which leads to better performances and higher self-efficacy beliefs (Tschannen-Moran, Hoy & Hoy, 1998).

This study examines the influence of teacher self-efficacy on teacher learning as teachers' belief in their own competences is becoming more important to successfully fulfil their new role and to adapt quickly to new situations. In addition, previous research has found strong effects of teacher self-efficacy on teachers' participation in the learning activities keeping up-to-date, experimenting, reflection, asking feedback and sharing information (Geijsel et al., 2009; Oude Groote Beverborg, 2015; Thoonen et al., 2011). So, when teachers have self-efficacy beliefs, they are more willing to spend effort for their professional development.

Moreover, findings of earlier research conducted in elementary education indicated that teacher self-efficacy is a mediator between transformational leadership practices and individual learning of teachers (Geijsel et al., 2009; Thoonen et al., 2011). Oude Groote Beverborg (2015) did not find a mediating role of teacher self-efficacy in the influence of transformational leadership and teachers' individual and social learning in VET colleges. He concluded that the different findings might be explained by the context in which studies are performed. Based on these findings, this study examines if the generic leadership practices influence teacher self-efficacy and if teacher self-efficacy is a mediator between leadership practices and individual and social learning of teachers in elementary education.

The thesis starts with a theoretical framework in which the concepts professional learning of teachers, collective leadership practices and teacher self-efficacy are described. This results in a research question, hypotheses and research model (Chapter 2). Subsequently, the methods used for this research to collect and analyse the data are described (Chapter 3), followed by the results of the research (Chapter 4). The thesis ends with conclusion and discussion and recommendations for further research (Chapter 5).

2.1 INTRODUCTION

The goal of this chapter is to describe a theoretical framework to guide the research. First, the theoretical model used for this research is explained. Second, the concepts ‘professional learning of teachers’, ‘collective leadership practices’ and ‘teacher self-efficacy’ are described. Also, relations between these concepts, as found in previous research, are described. Finally, the research question and hypotheses are stated and the research model is explained.

2.2 FRAMEWORK

The theoretical framework used to guide this study is based on a model as developed in research about the influence of teachers’ psychological states, school organizational conditions and transformational leadership in teacher learning and the improvement of teaching practices in elementary education (Thoonen et al., 2011). This model assumes that transformational leadership practices and teacher self-efficacy have direct effect on teachers’ engagement in professional learning activities. In addition, it also assumes that transformational leadership has indirect effects on teachers’ professional learning activities through teacher self-efficacy. Based on the results of Thoonen et al. (2011) and other research, two main adjustments of the model were made.

The first adjustment is that in this study we choose to examine the influence of generic leadership practices instead of transformational leadership. The influence of transformational leadership on professional learning of teachers is not consistent across previous studies. The direct influence of transformational leadership practices on teacher learning has been positive, negative or absent (Geijsel et al., 2009; Runhaar, Sanders & Yang, 2010; Thoonen et al., 2011). In addition, findings from earlier research indicated that transformational leadership has no strong effect on school improvement, especially when these effects are compared to the effect of instructional leadership (Robinson et al., 2008). In line with

recommendations made by Thoonen et al. (2011) in this study we therefore argue to focus on the impact of generic leadership practices, which integrate transformational and instructional leadership practices. Four categories of leadership practices are distinguished: setting directions, developing people, redesigning the organization and improving the instructional program (Leithwood et al., 2008).

The second adjustment is that this research does not limit leadership to the school leader. Leadership in schools is not restricted to the formal leader, the school leader, but can come from many sources. Following Leithwood and Mascall (2008), this research uses the term ‘collective leadership’ to examine a form of distributed leadership that consists of the combined effects of all sources of leadership on professional learning of teachers.

The theoretical model to guide this research (Figure 1) assumed that collective leadership practices have direct influence on teacher self-efficacy and professional learning of teachers. The influence of collective leadership practices on teachers’ professional learning is also indirect, through teacher self-efficacy.

Figure 1. Theoretical model



2.3 PROFESSIONAL LEARNING OF TEACHERS

Inspired by adult learning theories, in this study professional development of teachers is conceptualized as learning in the workplace. This perspective on teacher learning in the workplace is promising. By participating in a variety of professional learning activities within the school, teachers stimulate both their own professional development and the development of the school and thus make a significant contribution for improving teaching and learning (Geijsel et al., 2009).

To come to a definition of professional learning of teachers in the workplace, three theoretical principles of Kwakman (2003) are applied. First, teacher learning is about teachers' participation in professional learning activities in the school. This integration of work and learning processes is necessary for improvements on individual and school level (DeSimone, 2009). The second principle is that teacher learning is both individual and social. Individual learning is important as teachers can generate new knowledge that can stimulate their professional development. Social learning is important for the exchange of knowledge and skills to make new knowledge available for others (van Woerkom, 2003). Third, teacher learning is necessary for teachers to develop professionally. Professional learning of teachers consists of activities that strengthen the professional development of teachers and, although not measured in this research, lead to continuous improvement of their teaching practices and enhancement of student learning (Kwakman, 2003). These theoretical principles raise the question in which professional learning activities teachers should participate to stimulate their professional learning and to contribute to school improvement.

Findings of previous research indicated that two individual learning activities, where other teachers are not needed, and one social learning activity, which requires other teachers, are crucial for promoting professional development of teachers (Thoonen et al., 2011; Oude Groote Beverborg, 2015). Individual learning refers to teachers' participation in learning activities that contribute to the generation of knowledge through non-reflective and reflective learning. This research uses the individual

learning activities 'keeping up-to-date' and 'experimenting and reflection' of Thoonen et al. (2011). Social learning refers to teacher learning by exchanging knowledge through collaboration in a social context (van Woerkom, 2004). Social learning is important for teacher learning as new information or knowledge does not only come from individual learning, but also to a large extent from interaction with other teachers (Kwakman, 2003). This research will use the social learning activity 'information sharing and asking for feedback' of Oude Groote Beverborg (2015), as this learning activity is important to make new knowledge available in a whole team.

In this study, professional learning of teachers is conceptualized as: teachers' participation in the individual learning activities keeping up-to-date, experimenting and reflection and the social learning activity information sharing and asking for feedback.

Keeping up-to-date

The first professional learning activity is the individual learning activity keeping up-to-date. This professional learning activity refers to "... the input of and search for new information, insights, and developments from different sources for the professional knowledge base underlying teachers' work" (Thoonen et al., 2011, p. 504). This includes gaining new knowledge by reading professional literature and keeping up-to-date with new insights and societal developments such as teaching methods, curriculum and teaching in general. Research has shown that enhancing knowledge of teachers affect teaching practices (Runhaar, 2008; Thoonen et al., 2011). The more teachers keep up-to-date, the more they use instructional strategies that facilitate situated, social and differentiated learning (Thoonen et al., 2001). So, the professional learning activity 'keeping up-to-date' is an important prerequisite for professional learning of teachers, as new knowledge enables teachers to continuously improve their professional work.

Experimenting and reflection

The second professional learning activity is the individual learning activity experimenting and reflection. Earlier research showed that teachers view reflection as an integral part of experimentation instead of a separate learning activity (Geijsel et al., 2009), therefore, this study uses the combination of these two learning activities. Experimenting refers to "... an intentional effort of teachers to try something new within the classroom..." (Kwakman, 2003, p. 153). Teachers experiment with new didactical and pedagogical things in their classroom to determine what works. The learning activity reflection refers to "... a person recreating the experience of acting in a given situation" (Oude Groote Beverborg, 2015, p. 41). Reflection aims to recognize and change teaching behaviour (Kwakman, 2003). Research showed that experimenting and reflection are more powerful predictors for improving teaching practices than keeping up-to-date.

Information sharing and asking for feedback

The third professional learning activity is the combination of social learning activities information sharing and asking for feedback, as results from earlier research showed that teachers perceive these learning activities as one social learning activity (Oude Groote Beverborg, 2015). Sharing of information refers to "... the effort of any team member to keep the flow of information going within a team" (Oude Groote Beverborg, 2015, p. 41). This activity includes making knowledge explicit and discussing how this knowledge is used and to what purpose. The learning activity asking for feedback is about seeking advice from other teachers and the school leader (van Woerkom, 2003). It entails the gathering of feedback to find suitable ways of teaching and learning.

Although the importance of social learning is stressed, the results of empirical research that examined the extent to which teachers participate in social learning activities tend to be rather disappointing (Kwakman, 2003). This could indicate that, participation of teachers in social learning activities is not very common in school organizations. Several reasons can explain these findings (Oude Groote Beverborg, 2015). First, teachers find

it hard to make time to reflect with colleagues beside their teaching tasks. Second, teachers are not used to share information with colleagues or ask for feedback as a result of their high degree of autonomy (Clement & Vandenberghe, 2000). Third, asking for feedback means that teachers expose themselves to criticism of other teachers, which may lead to feelings of uncertainty.

2.4 COLLECTIVE LEADERSHIP PRACTICES

Former research about the influence of leadership practices on teacher learning in the workplace argued that researchers should focus on a broader set of leadership practices to increase our understanding of the effect of leadership on teacher learning and school improvement (Leithwood et al., 2008; Oude Groote Beverborg, 2015; Robinson et al., 2008; Thoonen et al., 2011). Leadership studies in both school and non-school contexts have shown evidence for several categories of leadership practices that are used by almost all successful leaders (Leithwood, Seashore Louis, Anderson & Wahlstrom, 2004; Leithwood et al., 2008). Based on this, a model of leadership is developed, which is regarded to include the 'basics' of successful leadership (Leithwood & Jantzi, 2005; Leithwood & Seashore Louis, 2011; Leithwood, Mascall & Straus, 2009). This model has its roots in transformational theory (Podsakoff, MacKenzie, Moorman & Fetter, 1990), but has evolved to include elements of instructional leadership. Therefore, this 'integrated model' (Printy, Marks & Bowers, 2010) includes transformational and instructional leadership practices and is widely used by researchers to frame their research (Hendriks & Scheerens, 2013) and by some large educational systems to guide their leadership policies (Leithwood, 2012). Four categories of generic leadership practices are identified: setting directions, developing people, redesigning the organization and improving the instructional program.

Setting directions is the first category of leadership practices. Setting directions is about "... the establishment of shared purpose as a basic stimulant for one's work" (Leithwood et al., 2008, p. 30). The aim of setting directions is to help teachers to develop shared understandings

about the organization and its activities and goals that foster a sense of purpose and vision (Leithwood et al., 2004). The importance of setting directions can be explained by goal-setting theories of motivation which explain that performance goals can motivate people to mobilize effort, increase persistence and accomplish tasks (Werner & DeSimone, 2012). Specific leadership practices of this category are: fostering development of shared vision and goals and holding high performance expectations (Leithwood et al., 2008).

The second category of leadership practices is developing people and consists of the direct experiences teachers have with those in leadership roles as well as the organizational context in which teachers work (Leithwood et al., 2004). The aim of developing people is building not only the knowledge and skills that teachers need in order to accomplish school goals, but also the commitment, capacity and resilience to persist in applying these knowledge and skills (Leithwood et al., 2008). Specific leadership practices of developing people are: providing individualized support, providing intellectual stimulation and symbolizing good professional practice (Leithwood et al., 2008).

Redesigning the organization is the third category of leadership practices and is concerned with the establishment of work conditions, which allow teachers to make the most of their motivations, commitments and capacities (Leithwood et al., 2008). The aim of redesigning the organization is to develop schools as effective organizations that support teacher performance. This category of leadership practices has emerged from research about the nature of learning organizations and professional learning communities (Leithwood, Leonard & Sharratt, 1998). Redesigning the organization is important to facilitate the work of teachers and to match the structures in the school with the school's improvement agenda (Leithwood et al., 2007). The specific leadership practice of this leadership category is: developing collaborative decision-making structures (Leithwood et al., 2008).

The fourth category of leadership practices is improving the instructional program, which refers to fostering organizational stability and strengthening the schools' infrastructure (Leithwood et al., 2008). The aim of improving the instructional program is to support teachers in the teaching and learning process (Leithwood et al., 2007). The importance of improving the instructional program is explained by the concept of instructional leadership, which encourages a focus on improving classroom practices as the direction of the school (Leithwood et al., 2007). Specific leadership practices in this category, and used in this research, are: providing instructional support and monitoring school activities (Leithwood et al., 2008).

Current research in the field of educational leadership mainly focuses on the sources of leadership and reflects a growing appreciation for more 'distributed' forms of leadership. More and more research investigates leadership beyond the school leader and examines the effects of persons in formal and informal roles. This study uses the concept of 'collective leadership' to examine the combined effect of different sources of leadership (Leithwood & Mascall, 2008). Based on the context of this study, the combined influence of two formal leadership sources is investigated.

2.5 TEACHER SELF-EFFICACY

One of the most well known motivational theories is Bandura's social learning theory. Bandura developed a theory of motivation, which proposes that the expectancy component of motivation, called 'self-efficacy', influences individual performance. Self-efficacy is defined as "... the conviction that one can successfully execute the behaviour required to produce the outcomes" (Bandura, 1977, p. 193). So, self-efficacy is a future oriented belief about the level of competence that a person expects to display in a given situation. Influenced by Bandura's definition, teacher self-efficacy is defined as "... the teachers' belief in his or her capability to organize and execute courses of action required to successfully accomplish a specific teaching task in a particular context" (Tschannen-Moran et al., 1998, p. 233).

Teacher learning and self-efficacy

Self-efficacy of teachers is important for teacher learning as it determines how much effort they will spend on professional learning and how long they will persist in this learning when they face obstacles and negative experiences (Bandura, 1977). Previous studies confirmed direct and positive effects of teacher self-efficacy on professional learning (Geijsel et al., 2009; Oude Groote Beverborg, 2015; Thoonen et al., 2011). Teachers with high self-efficacy beliefs spend more effort to master teaching practices and persist when they face challenges, which leads to better teaching performance and which in turn leads to increased self-efficacy beliefs. Vice versa, teachers with low self-efficacy beliefs spend less effort to master teaching practices and give up more easily when they face challenges, which decrease their teaching performance and result in decreased self-efficacy beliefs (Tschannen-Moran et al., 1998). This indicates that teachers with high self-efficacy beliefs feel competent enough to meet new challenges and will also more engage in professional learning activities than teachers with less self-efficacy beliefs. Therefore, this study expects teacher self-efficacy to influence teachers' participation in learning activities.

Collective leadership and self-efficacy

Earlier empirical research found that leadership practices significantly affect self-efficacy beliefs of teachers (Walker & Slear, 2011). In addition, empirical evidence is available for the effects of transformational leadership practices on teacher self-efficacy (Geijsel et al., 2009; Nguni, Slegers & Denessen, 2006; Thoonen et al., 2011). Based on these findings, and our expectations about the effects of teacher self-efficacy on teacher learning, this study expects that the effects of the collective leadership practices on teachers' engagement in professional learning activities will be mediated by teacher self-efficacy.

2.6 RESEARCH QUESTION AND HYPOTHESES

The following research question is formulated to guide this research:

To what extent do collective leadership practices influence professional learning of teachers in elementary education, as mediated by teacher self-efficacy?

To answer the research question, the following hypotheses are stated:

Hypothesis 1 Professional learning of teachers is positively influenced by collective leadership practices (path C).

Hypothesis 2 Teacher self-efficacy is positively influenced by collective leadership practices (path A).

2.7 RESEARCH MODEL

The associated research model is depicted in Figure 2. The collective leadership practices are: setting directions (SD), developing people (DP), redesigning the organization (RO) and improving the instructional program (IP). The research model gives insights into the influence of each collective leadership practice on teacher self-efficacy (SE) and professional learning of teachers, measured as teachers' participation in the professional learning activities: keeping up-to-date (KD), experimenting and reflection (ER) and information sharing and asking for feedback (IF). In addition, this research investigates to what extent teacher self-efficacy mediates the influence of collective leadership practices on the professional learning of teachers. Therefore, teacher self-efficacy is a mediating variable in the research model.

Figure 2. Research model



3.1 INTRODUCTION

This chapter describes the methods used to conduct the research and gives a description of the context, the research design, the participants and sample of the research, the instruments and measures, procedures and methods used for the data analysis.

3.2 CONTEXT

The research is conducted among teachers of Codenz, a foundation in the Netherlands that consists of ten elementary schools. Codenz wants to stimulate professional learning of teachers at the workplace to reach personal and school ambitions. However, knowledge is lacking about how collective leadership can foster and stimulate this professional learning. Collective leadership consists of leadership of the school leader and leadership of the leader of the school board.

3.3 RESEARCH DESIGN

This study used a correlational research design. The purpose of correlational studies is to take a ‘snapshot’ of relations between variables at a single point in time (Field, 2009). In other words, this study investigates the relation between the independent variable collective leadership practices and the dependent variables teacher self-efficacy and professional learning of teachers.

Survey methods were used to gather quantitative data from teachers. Each teacher filled in an online questionnaire and the data was gathered at the individual level.

3.4 PARTICIPANTS AND SAMPLE

All ten elementary schools of Codenz participated in the research. The 179 teachers and teaching assistants were invited to participate. Teachers and teaching assistants who replaced another teacher of teaching assistant for a period of one month or longer were also included. Some persons were

excluded from this study. Trainee students were not invited, as they mainly participate in learning activities of the teacher training college. Also excluded were teachers and teaching assistants who replaced other teachers and teaching assistants for less than a month, as they work irregularly at different schools and do not participate in professional learning activities in the school. 127 of the 179 teachers and teaching assistants who received the questionnaires filled in the questionnaire, which is a response rate of 70%. Among the teachers who participated in this research 89% were women (national percentage: 85% women). The average age was 44 years (national mean: 43 years), ranging from 24 years to 65 years. The sample consisted of 94% teachers and 6% teaching assistants. The average years of experience in primary education was 18 years, ranging from 2 years to 44 years. The average years of experience in the school in which they currently taught was 10 years, ranging from 0 year to 36 years.

3.5 INSTRUMENTATION

The instrument used for this research was an online survey, which started with seven demographic items (e.g. gender). The survey continued with items about teachers’ participation in professional learning activities (keeping up-to-date, experimenting and reflection and information sharing and asking for feedback), teachers’ sense of self-efficacy and leadership practices of the school leader (setting directions, developing people, redesigning the organization and improving the instructional program) and the leader of the school board (setting directions, developing people and redesigning the organization). The average time to fill in the survey was 23 minutes. The items used in this survey can be found in Appendix 1.

3.6 MEASURES

The scales were measured using existing and well-validated scales on keeping up-to-date and experimenting and reflection (Thoonen et al., 2011), information sharing and asking for feedback (Oude Groote Beverborg, 2015), teacher self-efficacy (Thoonen et al., 2011) and collective leadership practices (Leithwood et al., 2008).

Professional learning of teachers

Professional learning of teachers consisted of the three scales keeping up-to-date, experimenting and reflection and information sharing and asking for feedback. All 21 items were scored on a 4-point Likert scale (1 = (almost) never, 2 = sometimes, 3 = often, 4 = (almost) always).

Keeping up-to-date The scale was measured with 6 items. The original scale consisted of 7 items, but 1 item was removed, as this item had a small factor loading in former research. An example item is: “I collect additional information about educational reforms”.

Experimenting and reflection The scale was measured by 5 items. The original scale consisted of 9 items, but 4 items were excluded, as they were included in the scale ‘information sharing and asking for feedback’. An example item is: “I try out new knowledge and skills in my lessons”.

Information sharing and asking for feedback The scale was measured by 10 items. An example item is: “I regularly ask feedback from my colleagues”.

Teacher self-efficacy

Teacher self-efficacy consisted of one scale. All 6 items were scored on a 4-point Likert scale (1 = (almost) never, 2 = sometimes, 3 = often, 4 = (almost) always). An example item is: “I feel that I am being successful in my work”.

Collective leadership practices

Collective leadership practices consisted of four scales. Permission was asked from the author for using the scales. Forward and backward translations were performed to secure reliable translations of the items from English into Dutch. Experts were asked to adjust the items to the Dutch context. Two subscales were excluded, as they were not applicable to the Dutch school context. Teachers scored the 41 items for the school leader (SL) and the 31 items for the leader of the school board (SB). In total, all 72 items of the scales were scored on a 4-point Likert scale

(1 = disagree, 2 = disagree more than agree, 3 = agree more than disagree, 4 = agree).

Setting directions The subscale ‘fostering development of shared vision and goals’ was measured with 6 items. An example item is: “SL&SB - Gives us a sense of overall purpose”. The subscale ‘holding high performance expectations’ was measured with 3 items. An example item is: “SL&SB - Has high expectations for us as professionals”.

Developing people The subscale ‘providing individualized support’ was measured with 4 items. An example item is: “SL&SB - Takes my opinion in consideration when initiating actions that affect my work”. The subscale ‘providing intellectual stimulation’ was measured with 7 items. An example item is: “SL&SB - Encourages me to pursue my own goals for professional learning”. The subscale ‘symbolizing good professional practice’ was measured with 6 items. An example item is: “SL&SB - Shows respect for staff by treating us as professionals”.

Redesigning the organization The subscale ‘developing collaborative decision-making structures’ was measured with 5 items. The original scale consisted of 6 items, but one item was excluded, as it did not suit the Dutch context. An example item is: “SL&SB - Ensures that we have adequate involvement in decision making”.

Improving the instructional program The subscale ‘providing instructional support’ was measured with 5 items. An example item is: “SL - The school leader regularly observes classroom activities”. The subscale ‘monitoring school activities’ was measured with 5 items. An example item is: “SL - Our school leader is visible within the school”.

3.7 PROCEDURES

First, the researcher introduced the research to all school leaders during a meeting. In addition, the researcher presented the research on each school to invite teachers to participate in the research. After the presentations, all

teachers received an email with information about the research and the presentation attached, as not all teachers could attend the presentation.

Second, the Ethics Committee of the Faculty of Behavioural, Management and Social Sciences approved the quality of the research and guaranteed that the research was in line with the ethical guidelines of the University of Twente. The survey included an Informed Consent that informed teachers about the voluntary participation and the procedures to guarantee privacy and anonymity. After accepting the Informed Consent, the participant could fill in the questionnaire.

Third, teachers received an email with the invitation to fill in the questionnaire and a hyperlink to the online questionnaire. The invitation included information about the purpose and procedures of the research like estimated time to fill in the survey, method and how privacy and anonymity were guaranteed. The link was connected with the online program Qualtrics in which the questionnaire was distributed. The teachers received all emails from the researcher and not from the school leader or leader of the school board, to decrease social-desirable answers.

Finally, teachers were given three weeks to fill in the questionnaire. The participants filled in the questionnaire at one moment in time, to increase the probability that questions were answered in accordance with each other and to increase the number of completed questionnaires. After the first and the second week, a reminder was sent to teachers who had not responded yet. At the start of the third week, all teachers and school leaders received an email with the response rate of their school and the desired response rate.

3.8 DATA ANALYSIS

Validity and reliability analyses

The program SPSS 22.0.2 was used to analyse the data. In order to ensure the validity and reliability, factor analyses and reliability analyses were conducted.

To explore the suitability of the data for factor analysis, The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were calculated (Field, 2009). The KMO measure of sampling adequacy was .846 for professional learning, .835 for teacher self-efficacy and .911 for collective leadership practices, which supports the factor analysis to be appropriate. Bartlett's test of sphericity was found significant for professional learning ($X^2(136) = 810.603, p < 0.001$), teacher self-efficacy ($X^2(15) = 281.281, p < 0.001$) and collective leadership practices ($X^2(820) = 4033.402, p < 0.001$). The complete factor analysis can be found in Appendix 2.

Factor analyses were conducted to determine the structure and to examine the construct validity of the variables (Field, 2009). Principal component analyses were used, as the purpose of the factor analyses is to find out which factors are present in the data and how the scales contributed to these factors (Field, 2009). The scales are based on existing and validated instruments and, therefore, a fixed number of factors was extracted for each factor analysis. To improve interpretation of the constructs professional learning of teachers and collective leadership practices, oblique rotation (direct oblimin) was used, as the factors of these constructs are expected to correlate. To identify variables that load on the factors, only factor loadings with an absolute value greater than .40 were interpreted (Stevens, 2002).

Reliability analyses (Cronbach's alpha, α) were conducted to measure the reliability of the scales of the questionnaire. The purpose of reliability analysis is to examine whether a scale consistently reflects the construct that is measured (Field, 2009).

Professional learning of teachers

The construct 'professional learning of teachers' consisted of three scales 'keeping up-to-date', 'experimenting and reflection' and 'information sharing and asking for feedback'. These three scales were entered together in the factor analysis.

Keeping up-to-date The principal component analysis with direct oblimin rotation showed factor loadings between .61 and .83. The reliability analysis showed a Cronbach's alpha of .83.

Experimenting and reflection The principal component analysis with direct oblimin rotation showed factor loadings between .46 and .83. The reliability analysis showed a Cronbach's alpha of .76. The reliability could be higher ($\alpha = .78$) when deleting the item "I make my own teaching materials". But, as this scale only consisted of five items, this item was not deleted.

Information sharing and asking for feedback The principal component analysis with direct oblimin rotation showed that the item 'I regularly share knowledge and experiences with team members' loaded on no factor, the item 'I discuss our criteria for good functioning with team members' loaded on another factor and the items 'I discuss what I find important in my work with team members' and 'I discuss how I have developed with my team members' loaded on more than one factor. As a result, these items were excluded to prevent bias. After exclusion, the factor analysis showed factor loadings between .49 and .84. Reliability analysis showed a Cronbach's alpha of .80.

The scales turned out to be reliable with Cronbach's alpha higher than .70. The scales 'keeping up-to-date' (6 items), 'experimenting and reflection' (5 items) and 'information sharing and asking for feedback' (6 items) were constructed by averaging the items of the scales.

Teacher self-efficacy

A factor analysis was performed for the scale 'teacher self-efficacy'. The principal component analysis showed factor loadings between .72 and .78. The reliability analysis showed a Cronbach's alpha of .84.

The scale turned out to be reliable with Cronbach's alpha higher than .70. The scale 'teacher self-efficacy' (6 items) was constructed by averaging the items of the scale.

Collective leadership practices

The construct 'collective leadership practices' consisted of the combination of leadership of the school leader and the leader of the school board by combining and averaging the items of the leadership scales. The construct consisted of the four scales 'setting directions', 'developing people', 'redesigning the organization' and 'improving the instructional program'. These four scales were entered together in the factor analysis.

The factor analysis and correlational analysis showed that all leadership scales were highly correlated (Table 1). In addition, the small sample size restricts the amount of variables in the research model. Based on this, the four scales were combined into a single scale 'collective leadership practices'.

Table 1. Pearson's bivariate correlation between the variables (total N: 127)

	SD	DP	RO	IP	SE	KD	ER	IF
SD	-							
DP	.813**	-						
RO	.782**	.832**	-					
IP	.568**	.599**	.566**	-				
SE	.234*	.236*	.193*	.069	-			
KD	.135	.142	.156	.037	.561**	-		
ER	.098	.160	.185	-.026	.516**	.509**	-	
IF	.264**	.278**	.268**	.255**	.384**	.456**	.454**	-

*. Correlation is significant at the 0.05 level (2-tailed)

** . Correlation is significant at the 0.01 level (2-tailed)

SD (N=116) DP (N=109) RO (N=112) IP (N=119) SE (N=126), KD (N=127), ER (N=127), IF (N=126)

The principal component analyses of the construct 'collective leadership practices' showed factor loadings between .45 and .85. The reliability analysis showed a Cronbach's alpha of .97.

The scale turned out to be reliable with a Cronbach's alpha higher than .70. The scale 'collective leadership practices' (41 items) was constructed by averaging the items of the scale.

Descriptive information

To explore the data, a frequency analysis was used. For collective leadership practices, teacher self-efficacy and professional learning of teachers, the minimum, maximum, mean and standard deviation were given.

In addition, the data was tested whether the distribution of the data was normal. Data is normally distributed when the skewness and kurtosis of the variables are between -2 and +2 (Field, 2009). The skewness and kurtosis of all variables were satisfactory.

In the data analysis phase of the study, possible differences in leadership practices of the school leader and leadership practices of the leader of the school board, as perceived by teachers, were examined (Table 2). The mean score of leadership of the school leader is higher than the mean score of leadership of the leader of the school board.

Table 2. Descriptive statistics for leadership of the school leader and leadership of the leader of the school board (total N: 127).

Variable	N	Min.	Max.	M	SD
School leader	119	1.12	4.00	3.08	.49
Leader of the school board	109	1.00	3.94	2.74	.63

All items of the study variables were scored on a 4-point Likert scale

Correlation analysis

To find significant relations between the variables keeping up-to-date, experimenting and reflection, information sharing and asking for feedback, teacher self-efficacy and collective leadership practices, correlations between the variables were examined. Bivariate Pearson correlation coefficient was used to find significant relations, as this is a standardized measure of the strength of a relation between variables (Field, 2009).

Simple mediation analyses

The research model hypothesizes that teacher self-efficacy will be mediating variable in the relation between collective leadership practices and the professional learning activities keeping up-to-date, experimenting and reflection and information sharing and asking for feedback. A simple mediation analyses was performed for each professional learning activity. Additionally, the bootstrapping method with bias-corrected 95% confidence intervals was used for the learning activity information sharing and asking for feedback (Preacher & Hayes, 2004).

During the data analysis, separated simple mediation analyses were performed for leadership of the school leader and leadership of the leader of the school board. The results showed that both sources of leadership contributed to teacher learning and teacher self-efficacy. However, leadership of the school leader had more direct and indirect effect than leadership of the leader of the school board.

4.1 INTRODUCTION

To come to an answer for the research question, this chapter describes the results of the data analysis. The chapter starts with a description of the variables. Subsequently, the results of the correlation analyses are described. Finally, the results of the simple mediation analyses are given. Based on the results, the hypotheses and research question as stated are confirmed or rejected.

4.2 DESCRIPTIVE STATISTICS

The mean scores and standard deviations of all the study variables are reported (Table 3). All items were scored on a 4-point Likert scale, which indicates that teachers often participate in individual and social learning activities at the workplace. It seems like teachers participate more often in individual learning activities than social learning activities, as the mean scores of keeping up-to-date (2.76) and experimenting and reflection (2.82) are higher than of information sharing and feedback (2.25). In general, teachers had high feelings of self-efficacy, as the average score is 3.02. Teachers perceived leadership practices of the school leader and the leader of the school board; the average score on collective leadership practices is 2.94.

Table 3. Descriptive statistics for professional learning of teachers, teacher self-efficacy and collective leadership practices (total N: 127).

Variable	N	Min.	Max.	M	SD
CL Collective leadership practices	109	1.94	3.98	2.94	.46
SE Teacher self-efficacy	126	1.50	4.00	3.02	.45
Professional learning of teachers					
KD Keeping up-to-date	127	1.94	3.98	2.76	.53
ER Experimenting and reflection	127	1.50	4.00	2.82	.49
IF Information sharing and asking for feedback	126	1.50	4.00	2.25	.48

All items of the study variables were scored on a 4-point Likert scale

4.3 CORRELATION

To explore the relations between the variables, Pearson correlation coefficient (r) was used. A correlation of $r \geq .10$ represents a small effect, a correlation of $r \geq .30$ is a medium effect and a correlation of $r \geq .50$ is a large effect (Field, 2009).

Results from the correlation analyses (Table 4) indicate that collective leadership practices are positively and significantly related to the professional learning activity information sharing and asking for feedback ($r = .325$, $p < 0.01$). The collective leadership practices were not significantly related to the professional learning activities keeping up-to-date and experimenting and reflection.

Results also suggest that collective leadership practices are related to the self-efficacy beliefs of teachers as a small positive relation was found between collective leadership practices and teacher self-efficacy ($r = .206$, $p < 0.05$).

The expected mediating role of teacher self-efficacy can be investigated, as medium to large positive correlations were found between teacher self-efficacy and the professional learning activities keeping up-to-date ($r = .561$, $p < 0.01$), experimenting and reflection ($r = .516$, $p < 0.01$) and information sharing and asking for feedback ($r = .360$, $p < 0.01$).

Table 4. Pearson's bivariate correlation between the variables (total N: 127)

Variable	CL	SE	KD	ER	IF
CL Collective leadership practices	-				
SE Teacher self-efficacy	.206*	-			
KD Keeping up-to-date	.109	.561*	-		
ER Experimenting and reflection	.104	.516*	.509**	-	
IF Information sharing and asking for feedback	.325**	.360**	.428**	.416**	-

*. Correlation is significant at the 0.05 level (2-tailed)

** . Correlation is significant at the 0.01 level (2-tailed)

CL (N=109) SE (N=126), KD (N=127), ER (N=127), IF (N=126)

4.4 SIMPLE MEDIATION ANALYSES

Since the bivariate Pearson's correlation provided enough evidence to examine the hypotheses, simple mediation analyses were performed.

According to the Baron and Kenny (1986) criteria for mediation, three conditions should be met. First, a significant relation should be found between the independent and dependent variable (path C). Secondly, the independent variable should significantly relate to the hypothesized mediating variable (path A). Thirdly, the mediating variable should significantly predict the dependent variable (path B). The extent to which the mediating variable explains the relation between the independent and dependent variable is called 'full mediation' or 'partial mediation' (path C'). Full mediation indicates that the direct effect of the independent variable on the dependent variable becomes insignificant when the mediating variable is included in the regression. Partial mediation means that the direct effect remains significant when the mediating variable is included in the regression.

Keeping up-to-date

Simple mediation analysis was conducted to examine the three conditions for the dependent variable keeping up-to-date (Table 5). First, it was found that collective leadership practices were positively, but not significantly related with keeping up to date ($B = .125$, $t(n-2) = 107$, $p > 0.05$) (path C). Secondly, it was found that collective leadership practices were positively and significantly related to teacher self-efficacy ($B = .203$, $t(n-2) = 107$, $p < 0.05$) (path A). Finally, results indicated that the mediator teacher self-efficacy was positively and significantly associated with keeping up-to-date ($B = .653$, $t(n-2) = 107$, $p < 0.01$) (path B).

Experimenting and reflection

Simple mediation analysis was conducted to examine the three conditions for the dependent variable experimenting and reflection (Table 6). First, it was found that collective leadership practices were positively, but not significantly related with experimenting and reflection ($B = .110$, $t(n-2) = 107$, $p > 0.05$) (path C). Secondly, it was found that collective leadership

practices were positively and significantly related to teacher self-efficacy ($B = .203$, $t(n-2) = 107$, $p < 0.05$) (path A). Finally, results indicated that the mediator teacher self-efficacy was positively and significantly associated with experimenting and reflection ($B = .575$, $t(n-2) = 107$, $p < 0.01$) (path B).

Information sharing and asking for feedback

Simple mediation analysis was conducted to examine the three conditions for the dependent variable information sharing and asking for feedback (Table 7). First, it was found that collective leadership practices were positively and significantly related with information sharing and asking for feedback ($B = .343$, $t(n-2) = 107$, $p < 0.01$) (path C). Secondly, it was found that collective leadership practices were positively and significantly related to teacher self-efficacy ($B = .203$, $t(n-2) = 107$, $p < 0.05$) (path A). Finally, results indicated that the mediator teacher self-efficacy was positively and significantly associated with information sharing and asking for feedback ($B = .331$, $t(n-2) = 107$, $p < 0.01$) (path B).

Because the a-path, b-path and c-path were significant, simple mediation analysis was tested using the bootstrapping method with bias-corrected confidence estimates (MacKinnon, Lockwood & Williams, 2004; Preacher & Hayes, 2004). In the present study, the 95% confidence interval of the indirect effect was obtained with 5000 bootstrap resamples (Preacher & Hayes, 2008). Results of the mediation analyses confirmed the mediating role of teacher self-efficacy in the relation between collective leadership practices and information sharing and asking for feedback ($B = .068$, $CI = .015$ to $.151$).

In addition, results indicated that the direct effect of collective leadership practices on information sharing and asking for feedback stayed significant when controlling for teacher self-efficacy ($B = .276$, $t(n-2) = 107$, $p < 0.01$) (path C'), thus suggesting partial mediation.

Table 5. Simple mediation analysis for keeping up-to-date

	Path A Effect of collective leadership on teacher self-efficacy		Path B Effect of teacher self-efficacy on keeping up-to-date		Path C Effect of collective leadership on keeping up-to-date	
Independent variable	B	SE	B	SE	B	SE
CL Collective leadership practices	.203*	.093	.653**	.096	.125	.110

*. p < .05 ** . p < .01

Table 6. Simple mediation analysis for experimenting and reflection

	Path A Effect of collective leadership on teacher self-efficacy		Path B Effect of teacher self-efficacy on experimenting and reflection		Path C Effect of collective leadership on experimenting and reflection	
Independent variable	B	SE	B	SE	B	SE
CL Collective leadership practices	.203*	.093	.575**	.090	.110	.101

*. p < .05 ** . p < .01

Table 7. Simple mediation analysis for information sharing and asking for feedback using bootstrapping of Preacher & Hayes (2008)

	Path A Effect of collective leadership on teacher self-efficacy		Path B Effect of teacher self-efficacy on information sharing and asking for feedback		Path C Effect of collective leadership on information sharing and asking for feedback		Path C' Effect of collective leadership on information sharing and asking for feedback mediated by teacher self-efficacy		Bootstrapping		
Independent variable	B	SE	B	SE	B	SE	B	SE	Effect	LL IC 95%	UL IC 95%
CL Collective leadership practices	.203*	.093	.331**	.095	.343**	.097	.276**	.094	.068	.015	.151

*. p < .05 ** . p < .01

4.5 HYPOTHESES

Based on the results of the simple mediation analyses, the hypotheses and research question, as stated in this research, can be confirmed or rejected.

Collective leadership practices and professional learning of teachers

The first hypothesis predicted a positive influence of collective leadership practices on the professional learning of teachers, as explained by path C.

This hypothesis is rejected for the individual professional learning activities keeping up-to-date and experimenting and reflection as collective leadership practices have a non-significant influence on these individual learning activities. This indicates that teachers' participation in keeping up-to-date and experimenting and reflection was not directly influenced by leadership practices of the school leader and the leader of the school board.

The hypothesis can be confirmed for the social professional learning activity information sharing and asking for feedback as collective leadership practices have a significant and positive influence on this social learning activity. This result suggests that if teachers experienced leadership practices of the school leader and the leader of the school board, they reported to be more engaged in the professional learning activity information sharing and asking for feedback.

Collective leadership practices and teacher self-efficacy

The second hypothesis predicted a positive influence of collective leadership practices on teacher self-efficacy, as explained by path A.

This hypothesis was confirmed by the results as collective leadership practices have a positive influence on teacher self-efficacy. This indicates that teachers, who perceived leadership practices of the school leader and the leader of the school board, reported higher levels of self-efficacy beliefs.

The mediating role of teacher self-efficacy

This study investigated the extent to which teacher self-efficacy mediated the influence of collective leadership practices on professional learning of teachers, as explained by path C'.

The research question is confirmed for the social professional learning activity. The results indicated partial mediation of teacher self-efficacy in the extent to which collective leadership practices influenced information sharing and asking for feedback. The confidence intervals of the bootstrapping method showed no 0, therefore, the mediating role of teacher self-efficacy was confirmed. This indicates that teachers' participation in social learning activities was also indirectly influenced by leadership practices of the school leader and the leader of the school board, through the influence on teachers' sense of self-efficacy.

5.1 INTRODUCTION

This study validated a model on the influence of psychological and school organizational factors in professional learning of teachers, that was previously tested in elementary education (Thoonen et al., 2011). Specifically, this study examined the influence of collective leadership practices on teachers' sense of self-efficacy and teachers' participation in individual and social learning activities. Moreover, this study also assessed the mediating role of teacher self-efficacy between collective leadership practices and teacher professional learning. This chapter elaborates on the most important findings of this study, the limitations of this study and suggestions for further research. Finally, practical implications are discussed.

5.2 CONCLUSION AND DISCUSSION

Collective leadership practices and professional learning of teachers

This study found small direct effects of collective leadership practices on the social learning activity information sharing and asking for feedback. This finding indicates that collective leadership practices can stimulate teachers to exchange information with and to seek advice from colleagues. This finding is in line with research of Oude Groot Beverborg (2015), who found small to moderate direct effects of transformational leadership practices on asking for feedback.

More specifically, research of Oude Groote Beverborg (2015) showed that the leadership practices intellectual stimulation and vision building positively influenced teachers' asking for feedback. When a school leader is intellectually challenging teachers, this raises teachers' awareness that exchanging knowledge and information in social interaction helps them in professional development. By building a vision, teachers are stimulated to elaborate on a meaningful content and to ask feedback from colleagues. This study confirms that by identifying a vision and providing intellectual

stimulation, teachers' engagement in social learning activities can be enhanced. Unfortunately, because of the small sample size and the high correlations between the leadership practices, in our study we were not able to examine the influence of each leadership practice like Oude Groote Beverborg (2015), who examined the influence of each specific transformational leadership practice on teacher learning. Therefore, we used the construct collective leadership practices, which included four generic categories of leadership practices.

Unlike the direct effects of the collective leadership practices on social learning, this research did not show direct effects of collective leadership practices on the individual learning activities keeping up-to-date and experimenting and reflection. This is in line with earlier research, which argued that the influence of leadership practices on individual learning seems to be more indirect (Oude Groote Beverborg, 2015). School organizational conditions, psychological factors and teamwork often mediate the effects of leadership on individual learning (Geijsel et al., 2009; Oude Groote Beverborg, 2015; Thoonen et al., 2011). Which indicates that leadership contributes to individual professional learning, through mediating variables at individual and school level.

Collective leadership practices and teacher self-efficacy

This study found direct and positive effects of collective leadership practices on teacher self-efficacy. This result indicates that teachers, who perceive leadership practices of the school leader and the leader of the school board, have stronger beliefs in their own capabilities.

Most studies also found effects of transformational leadership practices on teacher self-efficacy (Geijsel et al., 2009; Nguni et al., 2006; Ross & Gray, 2006; Thoonen et al., 2011). An exception is the study of Oude Groote Beverborg (2015), who did not find direct effect of transformational leadership practices on teacher self-efficacy. This difference in findings may be explained by the context in which the studies are performed. Elementary schools are relatively small, with often intense relations between school leaders and teachers. In secondary education or VET

colleges, schools are more loosely coupled organisations in which interactions with team members may have more strong impact on teacher self-efficacy than a less visible school leader. So, differences in the context in which the studies have been carried out, can explain the difference between the influences of leadership practices on teachers' sense of self-efficacy.

The mediating role of teacher self-efficacy

The findings of this study showed effects of teacher self-efficacy on teachers' engagement in all three professional learning activities. These findings indicate that if teachers' have high self-efficacy beliefs, they are more engaged in collecting new information, experimenting with and reflecting on teaching practices, discussing knowledge with colleagues and asking feedback from other teachers and the school leader. These results confirm the important role of teachers' sense of self-efficacy for teachers' participation in individual and social learning activities, as found in earlier studies (Geijsel et al., 2009; Oude Groote Beverborg, 2015; Thoonen et al. 2011). More specifically, the effect of teacher self-efficacy on keeping up-to-date and experimenting and reflection was stronger than the effect of teacher self-efficacy on information sharing and asking for feedback. Research of Oude Groote Beverborg (2015) showed similar differences between the influence of teacher self-efficacy on individual and social learning activities and explained this difference by the consequences of self-efficacy beliefs: teacher self-efficacy consists of teachers' beliefs in their own competences to meet new challenges. Teachers with high self-efficacy beliefs feel more competent to solve problems and face challenges and as a result, may less feel the need to discuss problems with others and ask other teachers for feedback. This could explain the differences between the effects of teacher self-efficacy on individual and social learning.

Finally, this study also found that teacher self-efficacy partially mediated the extent to which collective leadership practices contributed to teachers' participation in social learning activities. This indicates that if teachers perceived leadership practices, they were more engaged in information sharing and asking for feedback when they also had high self-efficacy

beliefs. Earlier research that examined if teacher self-efficacy mediated the influence of leadership practices on social learning of teachers, did not found a mediating role of teacher self-efficacy, as self-efficacy was not affected by any of the leadership practices used in this study (Oude Groote Beverborg, 2015). This study provides some evidence for the mediating role of teacher self-efficacy for teachers' engagement in social learning activities.

To conclude, most findings of this study are in accordance with findings from previous research. By using an integrated model, in which transformational and instructional leadership practices coexist and by using the concept of collective leadership to examine the combined effect of leadership from different sources, this study expanded existing models as used in previous research and two main conclusions can be stated.

First, the findings of this study showed that collective leadership practices directly affected teachers' engagement in the social learning activities information sharing and asking for feedback. Moreover, the leadership practices also influenced social learning of teachers through the influence of teacher self-efficacy. This indicates that collective leadership enhances teachers' belief in their own competences and, subsequently, stimulates teachers to make knowledge explicit and to seek advice from colleagues and the school leader.

Second, this study investigated the influence of two sources of leadership: the school leader and the leader of the school board. In the data analysis phase of this study, we examined the possible differences in the contribution to teacher self-efficacy and teacher learning by each source of leadership. The descriptive statistics showed that the mean score of leadership of the school leader were higher than the mean score of leadership of leader of the school board. This finding suggested that teachers experienced more leadership of the school leader than of the leader of the school board. In addition, the mediation analysis showed that leadership practices of both the school leader and the leader of the school board directly influenced information sharing and asking for feedback and

also partly through the influence on teacher self-efficacy. So, both sources of leadership contributed to social learning and teacher self-efficacy. Finally, the differences between the influences of both sources were examined. The findings showed that leadership of the school leader had more direct and indirect effect on social learning than leadership of the leader of the school board. This finding indicates that teachers' participation in social learning activities is more influenced by the school leader than by the leader of the school board. As both sources of leadership do influence teachers' participation in social learning activities and teacher self-efficacy, it was a good alternative to investigate leadership beyond the school leader and to include both the school leader and the leader of the school board.

5.3 LIMITATIONS AND RECOMMENDATIONS

The first limitation of this study is the small sample size of teachers. This study was conducted at ten elementary schools and despite the high response rate, the total amount of participants was low. Therefore, this study used the construct collective leadership practices instead of using separate leadership practices to limit the amount of variables in the research model. Although collective leadership practices influence teacher self-efficacy and teachers' engagement in social learning activities, the influence of each particular leadership practice on teacher learning remains unknown. Further research is needed to validate the findings of this study by using a bigger sample size with more elementary schools and more teachers to participate in the research. A bigger sample size allows researchers to use more comprehensive research models to examine the influence of each generic leadership practice on teacher self-efficacy and teacher learning. So, we agree with other researchers that studies should focus on the influence of the generic leadership practices (Leithwood et al., 2008; Oude Groote Beverborg, 2015; Robinson et al., 2008; Thoonen et al., 2011) and on the influence of each practice individually to increase knowledge about the effect of these leadership practices on teacher learning.

Unlike the direct and indirect effects of collective leadership practices on information sharing and asking for feedback, these effects were not found for the individual learning activities keeping up-to-date and experimenting and reflection. These findings suggest that leadership can directly contribute to social learning and that the influence on individual learning is more indirect and not only through the mediator teacher self-efficacy. Future research should furthermore explore the influence of other mediators that are considered crucial to enhance individual learning. Research of Oude Groote Beverborg (2015) showed the teamwork variable 'task interdependence' to be an important variable to include in the model. In addition, Hendriks & Scheerens (2013) concluded, in their review of empirical studies of indirect-effect models, that academic climate, teacher capacity, organisational capacity and instructional conditions are the most promising mediating variables in the influence of the four generic leadership practices on school improvement.

Additionally, this study examined the influence of leadership of the school leader and leadership of the leader of the school board. The leadership practices can be distributed over a variety of people in the school. Leithwood and Mascall (2008) examined potential sources of leadership like district administrators, principals, parents, students and teachers in formal roles. Other research focuses only on formal leaders in the school like principals, assistant principals and teacher leaders (Hulpia, Devos & van Keer, 2011). Further research should investigate the combined effects of more sources of leadership and the possible differences in the influence of each source, to have more influence on teacher learning and teacher self-efficacy.

A last limitation of this study is the research design used. This study used a correlational research design, which means that this study shows a 'snapshot' of the relations between variables at one moment in time. The disadvantage of correlational research is the static image of very dynamic processes in schools. To ensure causality between variables, longitudinal research is needed, which investigates processes in schools over a period of time (Hallinger & Heck, 2011; Oude Groote Beverborg, 2015; Slegers,

Thoonen, Oort & Peetsma, 2014; Thoonen, Slegers, Oort & Peetsma, 2012). Longitudinal studies can examine whether collective leadership practices and teacher self-efficacy contribute to teachers' participation in individual and social learning activities over time, to foster ongoing learning of teachers in the workplace and to sustain communities of learners in schools.

5.4 PRACTICAL AND THEORETICAL IMPLICATIONS

As emphasized in the notion of Education 2032, teachers are the key in reaching the new educational goals. Teachers have the opportunity to select subjects in the curriculum, in cooperation with the school leader, which suit the students and the school. This requires educational knowledge and collaboration in teacher teams. Therefore, collaboration with other teachers and the school leader and teachers' engagement in individual learning and social learning in the workplace is essential to adapt to the educational changes. Schools should become learning organisations in which both individual professional learning of teachers and school improvement is stimulated. This study gives insights in the contribution of leadership practices to teachers' engagement in social learning activities and the mediating role of teachers' self-efficacy beliefs. This knowledge can help schools and school leaders to stimulate teachers to exchange information with and to seek advice from colleagues. Beside teachers' individual learning, social learning of teachers is important to exchange knowledge with colleagues and to make new knowledge available for the whole team (van Woerkom, 2003). School leaders can facilitate time for teachers to observe or film lessons of colleagues, to create moments in which teachers can evaluate together on lessons and to exchange feedback. Schools can also arrange a day on which the school leader, teachers and even the leader of the school board develop a shared vision and school goals for the school. This can help teachers and school leaders to give feedback to each other in pursuing these shared goals.

Another practical implication for elementary schools is that this study draws attention for the importance of increasing teachers' self-efficacy beliefs. Based on the new educational goals for elementary education and

the changing role of teachers, teachers' belief in their own competences to successfully fulfil this new role, is crucial. According to previous research of Walker and Slear (2011), school leaders can increase teachers' self-efficacy beliefs by modelling instructional expectations, by communication essential information towards teachers and by helping teachers to see the greater meaning and purpose in their work. Furthermore, the social learning theory of Bandura (Bandura, 1977) proposes four sources that can foster self-efficacy: mastery experiences, vicarious experiences, social persuasions and physiological arousal. Research of Krakers (2015), into the influence of these four sources on teacher self-efficacy, showed that mastery experiences and physiological arousal mainly influenced teachers' self-efficacy beliefs. School leaders can increase teachers' mastery experiences by giving feedback about their performances to increase their positive interpretations of their experiences. Schools leaders can help teachers to gain positive physiological arousal by giving them individual support, based on their individual needs.

The results of this study indicate that collective leadership practices influence teacher self-efficacy and teachers' participation in the social learning activities information sharing and asking for feedback. This study used four categories of leadership practices to examine the influence on teacher learning. Further research should investigate the influence of each particular leadership practice on individual and social learning of teachers. In addition, the concept of 'collective leadership' is used and can be expanded by including more sources of leadership and by investigating more in depth the possible differences in contribution to teacher learning of each source. The findings of this study also show the importance of teacher self-efficacy for teacher learning. However, other mediating variables should be added to the model to identify psychological factors and school organizational conditions and the interaction between these variables that contribute to teacher learning. The findings of this study suggest that leadership practices and teacher self-efficacy contribute to professional learning of teachers in the workplace, in order to support teachers in adapting effectively to new ways of teaching and learning.

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ALGEMENE INFORMATIE

Als start van de vragenlijst vraag ik u naar enkele persoonsgegevens. Nogmaals benadruk ik dat deze gegevens vertrouwelijk worden behandeld en niemand naderhand inzicht heeft in individuele antwoorden.

1. Wat is uw geslacht?

Man
Vrouw

2. In welk jaar bent u geboren?

Geboortjaar:

3. Op welke school bent u werkzaam?

Aan Boord
De Branding
Christiaan Huygens
Het Kompas
Het Mozaïek
De Regenboog
De Richtingwijzer
De Tamarisk
De Zevensprong
Het Zuiderlicht

4. Wat is uw huidige functie?

Leerkracht
Onderwijsassistent

5. Wat is de omvang van uw aanstelling (aangegeven in werktijdfactor)?
(voor invallers, neem de werktijdfactor van afgelopen maand februari)

Werktijdfactor:

6. Hoe lang bent u als leerkracht / onderwijsassistent werkzaam in het basisonderwijs?
(dit schooljaar meegerekend)

... jaar

7. Hoe lang bent u als leerkracht / onderwijsassistent werkzaam op deze school?
(dit schooljaar meegerekend)

... jaar

PROFESSIONEEL LEREN

De volgende vragen gaan over verschillende aspecten van professioneel leren van leerkrachten en onderwijsassistenten tijdens het werk. Wilt u aangeven in hoeverre deze uitspraken op u van toepassing zijn?

- 1 = (bijna) nooit
2 = soms
3 = vaak
4 = (bijna) altijd

Op de hoogte blijven

1. Ik houd mezelf op de hoogte van ontwikkelingen in het onderwijs
2. Ook als deelname niet verplicht is, neem ik deel aan na- of bijscholing
3. Ik lees vakliteratuur
4. Ik bestudeer lesboeken en lesmateriaal grondig en regelmatig
5. Ik verzamel extra informatie over onderwijsvernieuwingen
6. Ik houd me op de hoogte van nieuw beschikbaar lesmateriaal

Experimenteren en reflecteren

1. Ik maak zelf lesmateriaal
2. Om mijn lespraktijk te verbeteren gebruik ik reacties van leerlingen
3. Ik oefen tijdens mijn lessen met nieuwe didactische vaardigheden
4. Ik sta na de les erbij stil hoe deze is verlopen
5. Ik probeer in mijn lessen nieuwe instructievormen uit

Informatie uitwisselen en feedback vragen

1. Ik deel mijn kennis en ervaringen regelmatig met collega's
2. Ik bespreek met mijn collega's wat ik belangrijk vind in mijn werk
3. Ik bespreek met mijn collega's onze criteria voor goed functioneren
4. Ik bespreek problemen in mijn lespraktijk met anderen om daarvan te leren
5. Ik bespreek met collega's hoe ik me ontwikkeld heb
6. Als ik vind dat ik mijn werk niet goed heb gedaan dan bespreek ik dit met collega's
7. Ik vraag collega's regelmatig om feedback
8. Ik bezoek lespraktijken van collega's om daar van te leren
9. Als ik vind dat ik mijn werk niet goed heb gedaan dan bespreek ik dit met onze schoolleider
10. Ik vraag onze schoolleider regelmatig om feedback

VAKMANSCHAP

De volgende vragen gaan over vakmanschap.

Wilt u aangeven in hoeverre deze uitspraken op u van toepassing zijn?

- 1 = (bijna) nooit
2 = soms
3 = vaak
4 = (bijna) altijd

1. Ik voel me erkend als professional
2. Ik heb het gevoel dat ik een steeds betere professional word

3. Ik heb het gevoel dat ik effectief kan werken
4. Ik ben tevreden over de kwaliteit van mijn werk
5. Ik heb het gevoel dat ik succesvol ben in mijn werk
6. Ik heb voldoende zelfvertrouwen om mijn standpunten over het werk te uiten

LEIDERSCHAP VAN DE SCHOOLLEIDER

De volgende vragen hebben betrekking op de schoolleider.

Ik wil graag weten hoe u de leiding van uw schoolleider ervaart.

Wilt u aangeven in hoeverre u het met de volgende uitspraken eens bent?

- 1 = mee oneens
2 = meer mee oneens dan mee eens
3 = meer mee eens dan mee oneens
4 = mee eens

Richting bepalen

Ontwikkeling van gezamenlijke visie en doelstellingen bevorderen

De schoolleider van mijn school...

1. Geeft ons een gevoel over welke richting we uit gaan
2. Helpt bij het verduidelijken van de praktische gevolgen van de missie van de school
3. Communiqueert de missie van de school naar personeel en leerlingen
4. Moedigt de ontwikkeling van schoolnormen aan waardoor wij open staan voor verandering
5. Helpt ons om de relatie tussen de missie van onze school en initiatieven van bestuur of ministerie te begrijpen
6. Werkt aan consensus onder het personeel voor het stellen van prioriteiten voor de doelen van de school

Hoge verwachtingen hebben

De schoolleider van mijn school ...

1. Heeft hoge verwachtingen over ons als professionals
2. Stelt hoge verwachtingen aan leerlingen

3. Verwacht van ons dat we effectieve vernieuwers zijn

Mensen ontwikkelen

Individuele steun bieden

De schoolleider van mijn school ...

1. Neemt mijn opvatting in overweging bij het initiëren van acties die mijn werk beïnvloeden
2. Is zich bewust van mijn unieke behoeften en expertise
3. Trekt geen individuen of groepen voor
4. Geeft morele steun door mij het gevoel te geven dat mijn bijdrage wordt gewaardeerd

Intellectuele stimulans bieden

De schoolleider van mijn school ...

1. Is een bron van nieuwe ideeën voor mijn professioneel leren
2. Stimuleert mij om na te denken over wat ik doe voor mijn leerlingen
3. Moedigt mij aan om mijn eigen doelen voor professioneel leren na te streven
4. Moedigt ons aan om professionele doelen te ontwikkelen die in overeenstemming zijn met de doelen van de school
5. Moedigt ons aan om onze lespraktijken te evalueren en te veranderen indien nodig
6. Moedigt mij aan nieuwe dingen uit te proberen in het verlengde van mijn eigen interesses
7. Faciliteert mogelijkheden voor het personeel om van elkaar te leren

Tonen van goed professioneel gedrag

De schoolleider van mijn school ...

1. Toont respect voor het personeel door ons als professionals te behandelen
2. Spreekt op een respectvolle manier in de omgang met leerlingen
3. Is bereid om eigen praktijken te veranderen op grond van nieuwe inzichten

4. Toont goede voorbeelden van hoe je problemen kunt oplossen die ik kan toepassen in mijn werk
5. Bevordert een sfeer van zorgzaamheid en vertrouwen onder het personeel
6. Is een voorbeeld van een succesvolle schoolleider

Organiseren

Structuren voor gezamenlijke besluitvorming ontwikkelen

De schoolleider van mijn school....

1. Delegeert leiderschap naar leerkrachten / onderwijsassistenten voor activiteiten die belangrijk zijn voor het bereiken van de doelen van de school
2. Verspreidt leiderschap breed onder het personeel
3. Zorgt ervoor dat we op een juiste manier worden betrokken bij besluitvorming
4. Faciliteert effectieve communicatie onder het personeel
5. Zorgt ervoor dat we een goede mate van autonomie hebben om zelf beslissingen te nemen

Het onderwijsprogramma verbeteren

Onderwijskundige steun bieden

1. Onze schoolleider biedt organisatorische steun voor de interactie tussen leerkrachten / onderwijsassistenten
2. Hulpmiddelen en technische assistentie zijn beschikbaar om het personeel te helpen de effectiviteit van het onderwijs te verbeteren
3. Onze schoolleider observeert regelmatig lessen
4. Na het observeren van lessen, werkt onze schoolleider samen met leerkrachten / onderwijsassistenten aan het verbeteren van de effectiviteit van het onderwijs
5. Onze schoolleider neemt vaak deel aan discussies over onderwijskundige zaken

Toezicht houden op schoolactiviteiten

1. Onze schoolleider is positief aanwezig in de school
2. Onze schoolleider is zichtbaar in de school

3. Onze schoolleider is makkelijk toegankelijk voor leerlingen en personeel
4. Onze schoolleider geeft blijk van belangstelling in de vooruitgang van leerlingen
5. Onze schoolleider evalueert vaak de vooruitgang van leerlingen

LEIDERSCHAP VAN DE BESTUURDER

De volgende vragen hebben betrekking op de bestuurder.

Ik wil graag weten hoe u de leiding van de bestuurder ervaart.

Wilt u aangeven in hoeverre u het met de volgende uitspraken eens bent?

1 = mee oneens

2 = meer mee oneens dan mee eens

3 = meer mee eens dan mee oneens

4 = mee eens

Richting bepalen

Ontwikkeling van gezamenlijke visie en doelstellingen bevorderen

De bestuurder ...

1. Geeft ons een gevoel over welke richting we uit gaan
2. Helpt bij het verduidelijken van de praktische gevolgen van de missie van de school
3. Communiceert de missie van de school naar personeel en leerlingen
4. Moedigt de ontwikkeling van schoolnormen aan waardoor wij open staan voor verandering
5. Helpt ons om de relatie tussen de missie van onze school en initiatieven van bestuur of ministerie te begrijpen
6. Werkt aan consensus onder het personeel voor het stellen van prioriteiten voor de doelen van de school

Hoge verwachtingen hebben

De bestuurder ...

1. Heeft hoge verwachtingen over ons als professionals
2. Stelt hoge verwachtingen aan leerlingen

3. Verwacht van ons dat we effectieve vernieuwers zijn

Mensen ontwikkelen

Individuele steun bieden

De bestuurder ...

1. Neemt mijn opvatting in overweging bij het initiëren van acties die mijn werk beïnvloeden
2. Is zich bewust van mijn unieke behoeften en expertise
3. Trekt geen individuen of groepen voor
4. Geeft morele steun door mij het gevoel te geven dat mijn bijdrage wordt gewaardeerd

Intellectuele stimulans bieden

De bestuurder ...

1. Is een bron van nieuwe ideeën voor mijn professioneel leren
2. Stimuleert mij om na te denken over wat ik doe voor mijn leerlingen
3. Moedigt mij aan om mijn eigen doelen voor professioneel leren na te streven
4. Moedigt ons aan om professionele doelen te ontwikkelen die in overeenstemming zijn met de doelen van de school
5. Moedigt ons aan om onze lespraktijken te evalueren en te veranderen indien nodig
6. Moedigt mij aan nieuwe dingen uit te proberen in het verlengde van mijn eigen interesses
7. Faciliteert mogelijkheden voor het personeel om van elkaar te leren

Tonen van goed professioneel gedrag

De bestuurder ...

1. Toont respect voor het personeel door ons als professionals te behandelen
2. Spreekt op een respectvolle manier in de omgang met leerlingen
3. Is bereid om eigen praktijken te veranderen op grond van nieuwe inzichten

4. Toont goede voorbeelden van hoe je problemen kunt oplossen die ik kan toepassen in mijn werk
5. Bevordert een sfeer van zorgzaamheid en vertrouwen onder het personeel
6. Is een voorbeeld van een succesvolle bestuurder

Organiseren

Structuren voor gezamenlijke besluitvorming ontwikkelen

De bestuurder ...

1. Delegeert leiderschap naar leerkrachten / onderwijsassistenten voor activiteiten die belangrijk zijn voor het bereiken van de doelen van de school
2. Verspreidt leiderschap breed onder het personeel
3. Zorgt ervoor dat we op een juiste manier worden betrokken bij besluitvorming
4. Faciliteert effectieve communicatie onder het personeel
5. Zorgt ervoor dat we een goede mate van autonomie hebben om zelf beslissingen te nemen

APPENDIX 2

FACTOR ANALYSES

Factor analysis professional learning of teachers

Item	KD	ER	IF
KD - I keep myself informed on developments within the field	.717		
KD - I take part in further training and in-service training even if it is not compulsory	.666		
KD - I read professional literature	.831		
KD - I study textbooks and lesson materials thoroughly and on a regular basis	.683		
KD - I collect additional information about educational reforms	.617		
KD - I keep myself informed on new didactic material	.729		
ER - I make my own teaching materials		.466	
ER - I use students' reactions to improve my classroom teaching		.834	
ER - I try out new didactic methods in my lessons		.775	
ER - I reflect on the quality of my lessons		.635	
ER - I try out new knowledge and skills in my lessons		.623	
IR - I discuss problems encountered in my teaching practices with others in order to learn from their responses			.525
IR - If I think that I have not done my work well, I discuss this with my team members			.492
IR - I regularly ask my team members for feedback			.740
IR - I observe colleagues' lessons to learn from them			.599
IR - If I think that I have not done my work well, I discuss this with my school leader			.849
IR - I regularly ask my school leader for feedback			.830
Eigenvalue	4.318	3.871	3.751

Extraction method: Principal Component Analysis

Rotation method: direct oblimin (rotation converged in 6 iterations)

KMO measure of sampling adequacy: .846 ('great', Field, 2009)

Bartlett's test of sphericity: $X^2(136) = 810.603$, $p < .001$ (significant)

Factor analysis teacher self-efficacy

Item	SE
SE - I am recognized as a professional	.734
SE - I feel that I am becoming a better professional	.783
SE - I feel that I am able to work effectively	.744
SE - I am satisfied with the quality of my work	.717
SE - I feel that I am being successful in my work	.766
SE - I have sufficient self-confidence to defend my own points of view about the work	.718
Eigenvalue	3.323

Extraction method: Principal Component Analysis

KMO measure of sampling adequacy: .799 ('good', Field, 2009)

Bartlett's test of sphericity: $X^2(15) = 281.281$, $p < .001$ (significant)

Factor analysis collective leadership practices

Item	CL
SD.VG - Gives us a sense of overall purpose	.765
SD.VG - Helps clarify the practical implications of the school's mission	.825
SD.VG - Communicates school mission to staff and students	.811
SD.VG - Encourages the development of school norms supporting openness to change	.791
SD.VG - Helps us understand the relationship between our school's mission and board or Ministry initiatives	.744
SD.VG - Works toward whole staff consensus in establishing priorities for school goals	.762
SD.PE - Has high expectations for us as professionals	.532
SD.PE - Holds high expectations for students	.514
SD.PE - Expects us to be effective innovators	.549
DP.IS - Takes my opinion in consideration when initiating actions that affect my work	.736
DP.IS - Is aware of my unique needs and expertise	.747
DP.IS - Is inclusive, does not show favouritism toward individuals or groups	.571
DP.IS - Provides moral support by making me feel appreciated for my contribution	.779
DP.IT - Is a source of new ideas for my professional learning	.739
DP.IT - Stimulates me to think about what I am doing for my students	.746
DP.IT - Encourages me to pursue my own goals for professional learning	.778
DP.IT - Encourages me to develop/review professional goals consistent with school goals	.752
DP.IT - Encourages me to evaluate our practices and refine them as needed	.803
DP.IT - Encourages me to try new practices consistent with my own interests	.796
DP.IT - Facilitates opportunities for staff to learn from each other	.737
DP.PP - Show respect for staff by treating us as professionals	.678
DP.PP - Sets a respectful tone for interaction with students	.663
DP.PP - Demonstrates a willingness to change own practices in light of new understandings	.830
DP.PP - Models problem-solving techniques that I can readily adapt for my work	.852
DP.PP - Promotes an atmosphere of caring and trust among staff	.711

DP.PP - Symbolizes success and accomplishment within our profession	.834
RO.DS - Delegates leadership for activities critical for achieving school goals	.695
RO.DS - Distributes leadership broadly among the staff	.708
RO.DS - Ensures that we have adequate involvement in decision making	.703
RO.DS - Facilitates effective communication among staff	.753
RO.DS - Provides an appropriate level of autonomy for us in our own decision making	.707
IP.IS - Our school leader provides organizational support for teacher interaction	.517
IP.IS - Resources and technical assistance are available to help staff improve effectiveness	.498
IP.IS - The school leader regularly observes classroom activities	.493
IP.IS - After classroom observations, our school leader works with teachers to improve effectiveness	.489
IP.IS - The school leader frequently participates in discussions of educational issues	.591
IP.MA - Our school leader has a positive presence in the school	.457
IP.MA - Our school leader is visible within the school	.480
IP.MA - Our school leader is easily accessible to students and staff	.459
IP.MA - Our school leader gives evidence of his/her interest in students' progress	.543
IP.MA - Our school leader frequently reviews student progress	.566
Eigenvalue	19.331

Extraction method: Principal Component Analysis
 KMO measure of sampling adequacy: .911 ('superb', Field, 2009)
 Bartlett's test of sphericity: $X^2(802) = 4033.402, p < 0.001$ (significant)