

## University of Groningen

### Teachers' capacity to realize educational change through inquiry-based working and distributed leadership

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DOI:  
[10.33612/diss.160149825](https://doi.org/10.33612/diss.160149825)

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*Document Version*  
Publisher's PDF, also known as Version of record

*Publication date:*  
2021

[Link to publication in University of Groningen/UMCG research database](#)

*Citation for published version (APA):*  
Amels-de Groot, J. (2021). *Teachers' capacity to realize educational change through inquiry-based working and distributed leadership*. University of Groningen. <https://doi.org/10.33612/diss.160149825>

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**Teachers' capacity to  
realize educational change through  
inquiry-based working and  
distributed leadership**

**Judith Amels - de Groot**

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**rijksuniversiteit  
groningen**

**Teachers' capacity to  
realize educational change through  
inquiry-based working and  
distributed leadership**

**Proefschrift**

ter verkrijging van de graad van doctor aan de  
Rijksuniversiteit Groningen  
op gezag van de  
rector magnificus prof. dr. C. Wijmenga  
en volgens besluit van het College voor Promoties.

De openbare verdediging zal plaatsvinden op

donderdag 25 maart 2021 om 12.45 uur

door

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geboren op 6 april 1962  
te Haarlem

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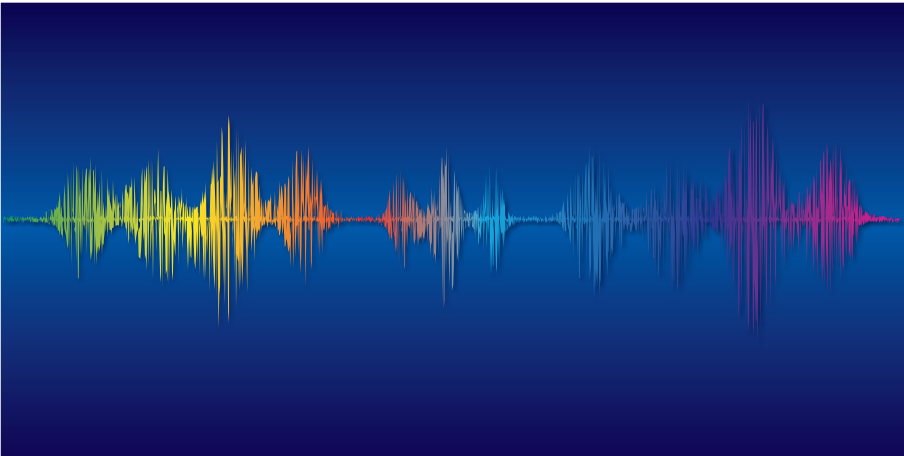
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# 1

## CHAPTER

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### GENERAL INTRODUCTION

---

*Das Geheimnis liegt in der Stille.*

*Die Stille grenzt nicht nur die Musik am Anfang und am Ende eines Werkes ein, sie ist auch Teil der ganzen Konstruktion. Sie gehört zum Basismaterial genauso wie die Noten, und sie erzielt jeweils ganz unterschiedliche Wirkung. (...) Sie erzeugt Spannung, sie bewirkt Konzentration und schafft Erwartungen.*

(Chailly, 2015, p.7)

## Introduction

Music is wonderful. But music cannot be heard without silence. Beside musical notes, silence is a second key element of music (Chailly, 2015). When one listens to the music, moments of silence are necessary to enjoy, dream, wait for what is to come, and expect. School leaders and teachers are constantly performing, showing an active attitude, which is important in education and school development. However, it could be worthwhile to make use of moments of silence, and wait and expect for colleagues to step forwards. Silence may arise in ourselves and between people. Silence can also be found in facts and data, as data need a listening ear to be analyzed and interpreted; in other words, to be transformed from data, into information, knowledge and wisdom (Krüger, 2018). In schools, to what extent do we listen to one another and to what is told?

Society is changing rapidly and technical and digital possibilities seem unlimited. This means that different meanings of knowledge and learning arise, which in turn means that schools need to change and develop (e.g., Biesta, Priestley, & Robinson, 2015; Krüger, 2010b; Pllana, 2019; Priestley, 2011; Thomson, McGregor, Sanders, & Alexiadou, 2009). Meanwhile, a school's performance has become public information, and schools' accountability has been accentuated (Krüger, 2010b). Against this backdrop, governments, school boards, and school leaders worldwide have emphasized the need to improve educational quality and teaching and learning strategies.

Focusing on school improvement means focusing on changes in educational practices at the school level. Schools must be able to navigate changing goals, changing means, and adapt to new knowledge in dynamic contexts (Katz & Dack, 2014; Seashore Louis & Lee, 2016) to enhance the quality of their education. Although educational quality is a context-embedded construct, several key features are commonly accepted, such as learners' ability to participate and learn in a healthy and safe environment supported by adequate recourses and facilities. In addition, basic knowledge, skills, and attitudes, particularly in the areas of literacy, numeracy, and life skills, must be taught by trained teachers who use child-centered teaching approaches in well-managed classrooms and schools to reduce disparities (e.g., Scheerens, 2011; UNICEF, 2000).

To meet the demands of initiating, adopting, and implementing educational changes to fully meet students' needs requires teachers to develop their capacity to change, to in turn develop their teaching and learning practices. Such a capacity to change encompasses all conditions at the school and teacher level that enhance educators' professional learning and promote advances in teaching (Hopkins, Stringfield, Harris, Stoll, & Mackay, 2014; Geijssel, van den Berg, & Slegers, 1999; Thoonen, Slegers, Oort, & Peetsma, 2012).

Governmental projects and policies aimed at educational development focus increasingly on data, since it is assumed that data influence student performance and teacher learning and as such, reinforce schools' and teachers' ability to reform and improve the quality of their education, such as by adapting teaching strategies (Datnow & Hubbard, 2015; Schildkamp, 2019; Schildkamp, Ehren, & Lai, 2012). However, data do not provide all the information needed by team members. Data must be analyzed and interpreted in order to formulate findings to urgent questions about students' results and schools' educational quality (Earl & Katz, 2006; Van Geel, Keuning, Visscher, & Fox, 2016; Schildkamp, 2019; Schildkamp, Poortman, Luyten, & Ebbeler, 2017; Uiterwijk-Luijk, Krüger, Zijlstra & Volman, 2017). Subsequently, so-called inquiry-based working, which encompasses an inquiry habit of mind, demonstrating data literacy, and data employment at the classroom and school level, is assumed to lead to school improvement (Datnow & Hubbard, 2015; Deppeler & Ainscow, 2016). Through inquiry-based working and using data, teachers collectively investigate their daily practices. Here, the question arises as to whether and how inquiry-based working can strengthen teachers' capacity to change.

Furthermore, in developing and maintaining inquiry-based working within schools, leadership may be essential, as school leaders can organize, encourage, and help teachers adopt inquiry-based work practices and encourage them to take ownership of the change process (Schildkamp, Poortman, Ebbeler, & Pieters, 2019; Uiterwijk-Luijk, Krüger, & Volman, 2019). In this sense, leadership can be assumed to be a feature of an organization rather than of a single person. Therefore, we adopt the distributed leadership perspective. Herein, teachers can adopt leadership roles, take initiatives and responsibility for realizing educational change (Spillane, 2012a, 2012b; Moin 2018). In the context of distributed leadership, teachers can use their expertise and are involved in decision-making (Buske, 2018; Heck & Hallinger, 2009; Seashore Louis & Lee, 2016; Spillane & Healey, 2010). Therefore, as in distributed leadership, all leadership activities are important, and attention must be paid to how and by whom these roles are distributed among team members. However, even though leadership can play a crucial role in organizing and supporting inquiry-based working (Uiterwijk-Luijk et al., 2019), research into inquiry-based working and distributed leadership has rarely explored how such ways of working affect teachers' capacity to realize educational change (Cranston, 2016). Besides understanding how inquiry-based working and distributed leadership affect teachers' capacity to change, this thesis supposes that there is also a mediating effect between inquiry-based working and distributed leadership that may be of interest to school leaders and teams that focus on realizing change to better meet their students' needs.

School leaders, who are the formal leaders in school organizations, are assumed to influence the extent to which leadership roles are distributed because they feel a sense of responsibility for what their school should be achieving (Bush & Glover,

2012). Leadership distribution depends on the school principal's influence, as well as on their perceptions of leadership (Harris & DeFlaminis, 2016; Spillane, Camburn & Pareja, 2007; Woods, 2016). Current discussions on distributed leadership and educational change are scarcely informed by analyses of how school leaders perceive leadership distribution in practice and how the presence of such leadership perspectives in schools relates to teachers' capacity to change (Bagwell, 2019).

This study firstly examines how inquiry-based working relates to teachers' capacity to change. In addition, the relationship between distributed leadership and teachers' inquiry-based working and capacity to change is investigated both quantitatively and qualitatively. Finally, to further investigate how school leaders' perceptions of distributed leadership relate to teachers' capacity to change, the aspects of teachers' capacity to change that are more present in schools where principals implement distributed leadership are compared with schools that apply another perspective on leadership.

The following section presents the conceptual framework that underlies this dissertation. The research aims and questions are subsequently defined. Then, the methodological approach is detailed. Finally, the structure of this dissertation is provided through an overview of the chapters.

### **Conceptual framework**

The current study can be situated in the ongoing discussion on educational reforms and school improvement of the last decades. Schools have been faced with both ongoing large-scale educational reform efforts and small-scale efforts to improve the quality of education and to implement educational innovations. However, as evaluations of educational reforms show, changing teachers' practices is extremely difficult (Commissie Parlementair Onderzoek Onderwijsvernieuwingen, 2008; Fullan, 1999; Stoll, 2013; Van Veen, Bloemert, & Wolthuis, in press). In line with Richardson and Placier (2001), Slegers and Leithwood (2010) argue that to understand the complex nature of educational change, teacher change needs to be reconceptualized by using perspectives in which teacher learning embedded in the school is considered a key component of successful school improvement. Main aim for schools in this perspective is to enhance the professional learning of teachers and to transform reform into accountable, learner-oriented, teaching practice (Fullan, 1999; Stoll, 2009; Slegers & Leithwood, 2010).

According to Richardson and Placier (2001), two views on school improvement and educational change can be distinguished: The first view refers to the implementation of externally developed reform designs into schools, the outside view. The second view, described as the inside view, refers to the capacity of schools to transform

themselves into learning environments for teacher change. These views perceive educational change differently. Richardson and Placier (2001) refer to Chin and Benne's (1969) distinction between planned change, empirical-rational approaches to change, and normative-reeducative approaches, which is still useful to understand those different perspectives. The empirical-rational strategy focuses on research-based models for change which assume that teachers will implement changes in their classrooms which are demonstrated to improve student learning. The normative-reeducative conception of change focuses on the professional growth of teachers in the school and on the problem-solving capacities of the school itself, assuming that personal sense-making and collective learning are key. Furthermore, in the empirical-rational perspective teachers are perceived as mere recipients of new teaching behavior and policy of researchers and policymakers. While the assumption in the normative-reeducative approach is that change is part of a larger process of collectively making sense of new situations.

Our study can be situated within the inside view, that focuses on schools' and teachers' capacity to change, assuming that in the context of Dutch primary schools and teachers such an approach is more successful than the outside view. First, Dutch primary school teachers tend to view themselves as professionals, who are emotionally very involved and connected to their work, performing in a context of educational system of high quality (van Veen, 2011). Second, there is a reform heritage of large-scale reforms that were introduced top down as improvement though largely failed because they were mainly ideological and not empirical based (Commissie Parlementair Onderzoek Onderwijsvernieuwingen, 2008; Van Veen, et al., in press). Third, the current reforms in Dutch primary education place a large demand on schools' capacity to change, as will be discussed later.

A main assumption within the inside approach is that educational change can be realized through the acquisition of more knowledge and understanding about learning, which refers to processes of organizational learning. Organizational learning can be defined as the activities through which organizational members construct new knowledge, or reconstruct existing knowledge in order to improve the functioning of individual organizational members and the organization as a whole (Leithwood, Aitken, & Jantzi, 2001). Different levels of learning in schools are distinguished by Leithwood and Louis (1998): learning of individuals in organizational contexts; small group or team learning that occurs within sub-units of the organization; and collective learning of the organization as a whole. Individual learning is considered to be necessary but insufficient for organizational learning; and organizational learning is more than the sum of all individual learning. Staff members share their knowledge and expertise by cooperating and exchanging information (Little, 1990). Cooperation can contribute strongly to improving instructional quality and, hence, student achievement (Vangrieken, Dochy, Raes,

& Kyndt, 2015). Especially, regarding the current study, the inquiry-based way of working refers to such processes of organizational learning due to its collective nature and the strong collaboration it requires. The assumption is that such processes of organizational learning will strengthen teachers' capacity to change.

### ***Teachers' capacity to realize educational change***

Dutch schools face many challenges, such as the management of cultural and religious diversity in classrooms, the emphasis on data use to implement a results-oriented approach, achieving minimal core goals, and the support of children with learning disabilities and pupils from disadvantaged backgrounds ('Passend onderwijs'). To acknowledge, manage and support diversity in such a broad sense is a complex challenge to teachers and school leaders (Schuman, 2013). Focusing on achieving minimal learning standards, 21<sup>st</sup> century goals and the support of all pupils require schools to adapt their teaching practices. To address such challenges, teachers need to discuss plans and to collaborate. For example, without joint work and a high level of task interdependency, ongoing instructional and pedagogical processes cannot be guaranteed, whereas these processes are essential for the students learning and well-being. Also, they need to professionalize (Fullan, 1999; Sleegers & Leithwood, 2010) and collect and use information (Geijsel, Sleegers, Stoel, & Krüger, 2009; Stoll, 2009, 2013).

Stoll (2009) and Harris, Adams, Jones, & Muniandy (2015) refer in the context of realizing educational change to the complexity and interconnectedness of the current society, such as a variation in contexts between schools, the relevance of a capacity to change 'habit of mind' and the essence of developing leadership capacity. In general, teachers' capacity to change is defined as their capacity to adopt innovations initiated by the governments, school boards, or themselves, as well as their potential to connect educational development and improvements to both individual and collective learning processes that engender change (Geijsel, Van den Berg, & Sleegers, 1999; Geijsel et al., 2009; Harris et al. 2015). In this study, in which we follow the inside view (Richardson & Placier, 2001), educational change refers to changes in teaching practices that aim to improve students' learning in a broad sense. Herein, also, attention is paid to teachers' professional growth and problem-solving capabilities. Therefore, we define teachers' capacity to realize educational change as their ability to initiate and adopt changes in their teaching practice with the aim of improving students' learning in a broad sense: cognitively, artistically, and emotionally.

Capacity to change in the context of inquiry-based working is difficult to measure directly because teachers per school or even within schools can differ regarding the changes they initiated and adopted. So, capacity to change in the current study is operationalized more indirectly by exploring aspects that contribute to

and therefore indicate teachers' capacity to change. Based on the work of Stoll (2009, 2013), Ho and Lee (2016), Geijsel et al. (1999), Geijsel et al., (2009), and Diseth, Danielsen, and Samdal, (2012), three aspects that are all assumed to contribute to teachers' capacity to change are explored:

1. the interpersonal aspect: teacher collaboration;
2. the organizational aspect: teachers' undertaking of professional learning activities; and
3. the personal aspect: motivational variables, such as the extent to which teachers internalize school goals into personal aims, their sense of self-efficacy, and their job satisfaction.

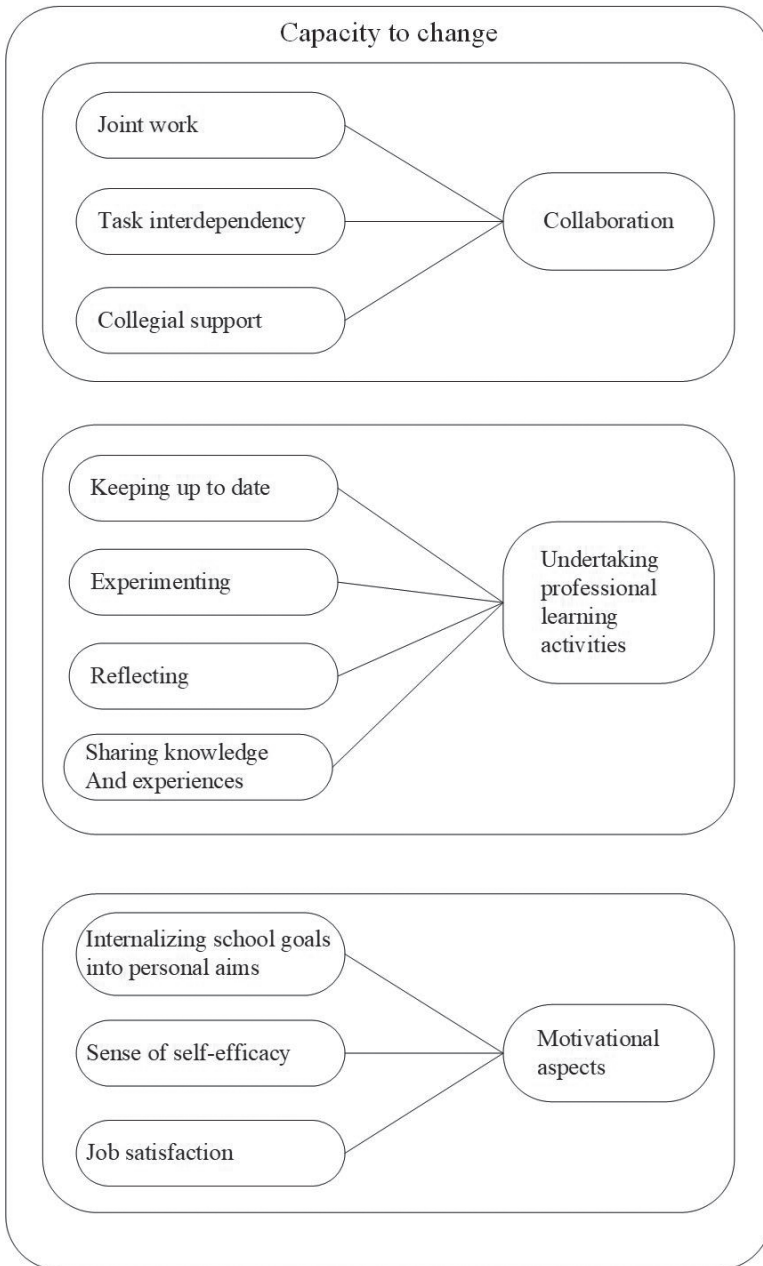
Firstly, teachers' capacity to change in terms of collaboration implies a readiness to engage in collective acts such as joint work (Little, 1982). They are likely to devote time, effort, and energy to changing and learning to solve problems or attain certain goals (Philpott & Oates, 2017; Stoll, 2009). These collective acts require collaboration, because support from and deliberation with colleagues is essential in successfully realizing change (Hargreaves & Fullan, 2012; Ho & Lee, 2016; Mayotte, Wei, Lamphier, & Doyle, 2013). Joint work is defined as teachers collectively engaging in instructional planning and solving problems by exchanging experiences, ideas, and methods, such that they develop shared and innovative teaching practices (Little, 1982). Joint work has the highest level of task interdependency, which is defined as the extent to which one teacher's task performance is dependent on the task performance of others (Little, 1982; Meirink, Imants, Meijer, & Verloop, 2010; Oude Groote Beverborg, Slegers, Endedijk, & Van Veen, 2015). Collegial support enhances collaboration and refers to the idea that teachers share the belief that change should be a collective effort (Coburn & Turner, 2011; Thoonen, Slegers, Oort, & Peetsma, 2011). In line with this, in the present study, collaboration is investigated as joint work, a high level of task interdependency, and collegial support.

Secondly, teachers' undertaking of professional learning activities is the organizational aspect of teachers' capacity to change. Teachers' active learning is determined by the extent to which they keep up to date with educational developments (Borman, Hewes, Overman, & Brown, 2003; Geijsel et al., 2009). Teachers who engage in such learning activities tend to experiment and reflect and share their knowledge and experiences more. Teachers' professional learning activities reflect how and to what extent they use learning opportunities for active learning, as well as how much they dare to experiment with and reflect upon their own work and classroom teaching (Hargreaves & Fullan, 2012; Mayotte et al., 2013). In line with this, with regard to teachers' professional learning activities, this study focuses on the extent to which teachers remain up-to-date, experiment, reflect, and share their knowledge and experiences with their colleagues.



Thirdly, the personal aspect of teachers' capacity to change must be considered, as teacher's beliefs about their own capacity are crucial to the motivational processes that lead to commitment and change (Geijsel et al., 2009; Thoonen et al., 2011). A positive emotional state enhances teachers' awareness of current educational trends and fortifies their propensity to look closer at such trends and apply new developments in their teaching practices (Geijsel et al., 2009; Kapa & Gimbert, 2018). In this study, we focus on three motivational variables, namely, the extent to which teachers internalize school goals into personal aims, teacher's sense of self-efficacy, and job satisfaction. When teachers internalize school goals into personal aims, they tend to be more committed to their schools and more motivated to initiate or participate in learning and changing processes (Geijsel et al., 2009). In addition, a sense of self-efficacy contributes to teachers' commitment and involvement in change, because teachers with strong beliefs about their self-efficacy feel more adequately equipped to do their job (Diseth et al., 2012; Thoonen et al., 2011; Valenzuela, Bellei, & Allende, 2016). These teachers also tend to be more persistent in problem solving and finding explanations and answers (Oude Groote Beverborg et al., 2015). Teachers' sense of self-efficacy is defined as teachers' tendency to persevere in their teaching beliefs and behaviors due to feeling adequately equipped for their role (Bandura, 1977; Oude Groote Beverborg, et al., 2015). Teachers' contribution to change and the way they embrace changes are also influenced by the extent to which they feel satisfied in their job (Thoonen et al., 2011). In this study, job satisfaction is described as the result of a positive emotional state achieved based on one's own job experiences (Hulpia, Devos & Rosseel, 2009).

In figure 1, an overview of all three aspects of teachers' capacity to change, including the sub-scales, is displayed.



**Figure 1.** Teachers' capacity to realize educational change concept

***Inquiry-based working***

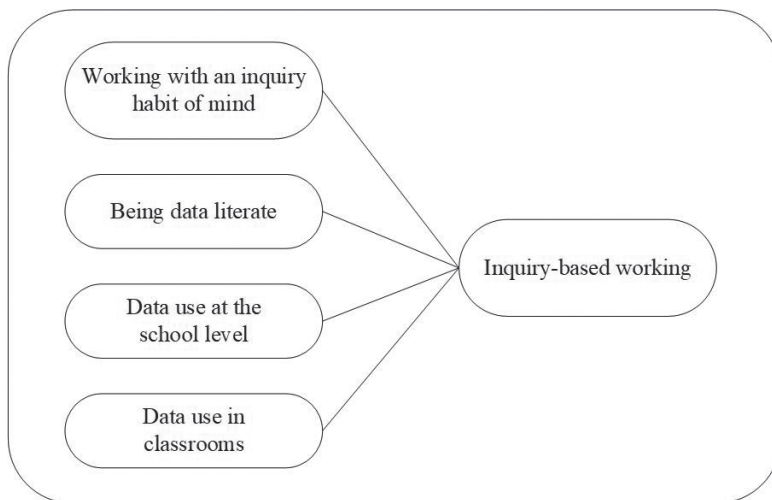
For several reasons, inquiry-based working is important (Krüger, 2010b). First, as the society has changed from an industrial to a knowledge society, students and teachers need to be critical, inquiring citizens. Second, as the society and schools change, being creative and innovative requires a need for data both to support innovation and to monitor the innovation. Third, schools are held more and more responsible for the effectiveness of the school (external accountability), which also demands for data collection. Although the term data driven decision making (DDDM) is commonly used (Ikemoto & Marsh, 2007; Lai & Schildkamp, 2013; Van Geel et al., 2016), in the present study the term inquiry-based working is used, following Earl & Katz, 2006; Krüger, 2010; Mandinach & Schildkamp, 2020; Uiterwijk-Luijk, Krüger, & Volman, 2019; Uiterwijk-Luijk et al., 2017. Whereas DDDM emphasizes the accountability perspective, which might be counterproductive to learning, in inquiry-based working the focus lies on the development perspective, which is needed in educational change.

Thus, schools need to consider a new approach to students' and teachers' learning due to changes in society and the educational environment (e.g., Biesta et al., 2015; Krüger, 2010b; Pllana, 2019). Through data use, schools are assumed to let go of old routines and adopt non-routines focused on improvement (Katz & Dack, 2014; Seashore Louis & Lee, 2016; Schildkamp et al., 2019). In this study, by adopting a holistic perspective, data use is broadly interpreted. As such, in line with research by Earl and Katz (2006) and Uiterwijk-Luijk et al. (2017), the inquiry-based working approach is followed, which differs from the results-oriented approach. The results-oriented approach emphasizes data use in the context of accountability, whereby principals and teachers are held accountable for the educational quality they provide (Lai & Schildkamp, 2013). Here, math and reading results specifically are of great importance. In the inquiry-based working approach, the focus is on school and educational development using all available data. Here, data are interpreted broadly and are collectively used to realize the necessary educational changes. In this way, the results-oriented approach can be seen as an aspect of inquiry-based working in schools (Krüger, 2018).

Inquiry-based working is defined as having an inquiry habit of mind, being data literate, and creating a culture of inquiry. In inquiry-based working, various types of data are systematically collected and analyzed to improve the performance of both students and the school (Marsh & Farrell, 2015). All the available data are used, which means that teams use quantitative data (e.g., test results), qualitative data (e.g., interviews, observations reports), input data (e.g., educational level, age, children's school entry), process data (e.g., observational data on school improvements), satisfaction data (e.g., stakeholder satisfaction surveys), and output data (e.g., student outcomes). Besides internal data, which offer insights into effective teaching

and learning strategies and results, external research also provides insights, since such information can be evidence-based and shows successful strategies for realizing educational change. Globally, schools are held accountable, and data can help support accountability. However, even more important is data's ability to highlight the need to focus on development; therefore, data may play a key role in realizing educational change (Brown & Greany, 2018; Earl & Katz, 2006; Krüger, 2010b; Schildkamp et al., 2017).

Following Krüger (2010a), Schildkamp et al. (2012), and Uiterwijk-Luijk et al. (2017), in this study, four aspects of inquiry-based working are distinguished: (1) teachers working with an inquiry habit of mind, (2) teachers' being data literate, (3) teachers' use of data at the school level, and (4) the use of data in classrooms aimed at improving educational quality (see figure 2).



**Figure 2.** Inquiry-based working concept

Teachers who work with an inquiry habit of mind are curious, ask questions, and are open to engaging in deep learning. In addition, they should be able to switch perspectives and discard existing routines to create new ones (Van der Rijst, Kijne, Verloop, & Van Driel, 2008; Uiterwijk-Luijk et al., 2017). A well-developed inquiry habit of mind is assumed to strengthen a teacher's sense of self-efficacy (Krüger, 2010b; Uiterwijk-Luijk et al., 2017).

Teachers who demonstrate data literacy are able to obtain meaningful information, learn from data, and make informed decisions (Mandinach & Gummer, 2013). Data literate teachers understand different types of data, are competent at interpreting

data, and are able to report their findings to others. They identify, collect, organize, analyze, summarize, and prioritize data, and are able to transform data into information and subsequently into actionable knowledge (Mandinach & Gummer, 2013; Van Geel et al., 2016; Krüger, 2018). Such actionable knowledge can better meet students' educational needs, which means that the focus should not be on the data but on "*clear and measurable goals*" (Mandinach & Schildkamp, 2020, p. 3). Further, in such processes, an awareness of existing potential bias is crucial (Katz & Dack, 2014; Mandinach & Schildkamp, 2020).

In an inquiry-based approach, data inform teachers of the instructional and learning tools that must be adopted to better meet students' needs (Deppeler & Ainscow, 2016). Consequently, when inquiry-based working is a commonly accepted way of working in a school, teachers also use data collectively at the school level to improve educational quality. By using data, teachers learn collectively, as the transformation from information to knowledge requires interactions that lead to new insights and knowledge at the school level (Ainscow, Dyson, Goldrick, & West, 2016; Seashore Louis & Lee, 2016). School cultures in which data use, an inquiry habit of mind, and data literacy are common may be more likely to realize educational improvement (Krüger & Geijsel, 2011; Schildkamp et al., 2012).

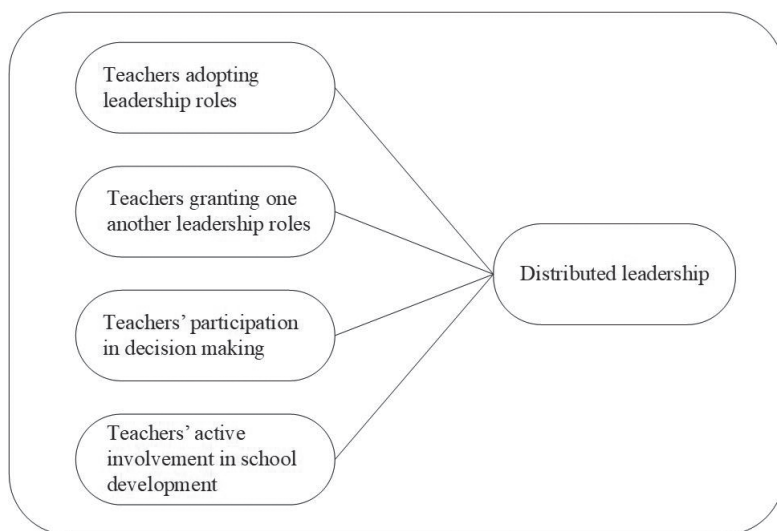
### ***Distributed leadership***

One of the most relevant organizational conditions that influence organizational learning processes in the school is the role of school leadership (Buske, 2018; Diamond & Spillane, 2016; Harris, 2014; Leithwood et al., 1999; Slegers & Leithwood, 2010; Stoll, 2009). Moreover, as Marks et al. (2000) stated in this context is the relevance of empowering teachers in decision-making processes, and developing cultures which value shared responsibilities and values. Organizational learning is a collective process, involving most teachers, and seems to be more successful when teachers are perceived as professionals and their agency is respected (Imants & van der Wal, 2019).

Recently, such processes of school leadership are conceptualized as distributed leadership (Spillane, 2012b). As Stoll (2009, p.122) noted: "Leading school improvement can't be done by one person alone: developing leadership capacity is essential." The degree of autonomy that teachers have to innovate and be creative influences the success of educational changes. A well-supported distribution of leadership, wherein leadership is regarded as an organizational characteristic instead of the responsibility of one person, can enhance an organization's capacity to learn and change (DeMatthews, 2014). As such, in the present study, the distributed leadership perspective is adopted to analyze the role played by leadership among teachers who adopt inquiry-based work practices.

Although Tian, Risku, and Collin (2016) point out in their meta-analysis that a blueprint or consensus definition of distributed leadership does not exist, some common core elements distinguish distributed leadership from other leadership concepts. In the distributed leadership perspective, teachers' expertise is employed, responsibility is shared by teams, and decisions are made collectively. In a team, the team member who is the best-equipped or skilled with respect to a particular goal or organizational necessity adopts a leadership role (Binkhorst, Poortman, McKenney, & Van Joolingen, 2018; Diamond & Spillane, 2016; Spillane, 2012a; Harris, 2014). In this perspective, both formal and informal leadership roles are involved. The adoption of informal leadership roles changes over time, and teachers grant one another such roles as individual expertise is recognized. If teachers are able to be involved in leadership, their needs of feeling ownership and a sense of professional self-efficacy are strengthened (Bangs & Frost, 2016). How leadership roles are distributed can be reflected in collective decision-making, since all team members have the ability to participate in decision-making processes at the school level, and all team members' contributions to educational improvement should be considered (Heck & Hallinger, 2009). Leadership distribution is also reflected in teachers' adoption of leadership roles, initiatives, and responsibility, and their granting of one another leadership roles based on their expertise or affinities for a particular role (Spillane, 2012a).

Based on the above-mentioned factors, leadership was investigated in this study using four scales: (1) teachers' adoption of leadership roles based on their expertise; (2) teachers' granting of one another leadership roles based on their expertise; (3) teachers' participation in decision-making at the school level; and (4) teachers' active involvement in school development (see figure 3).



**Figure 3.** Distributed leadership concept

The extent to which leadership roles are distributed depends on the school leader's beliefs about what a school should be achieving, his or her perspective on leadership (Harris & DeFlaminis, 2016; Woods, 2016), the expertise that exists among teachers, and his or her own capabilities (Bush & Glover, 2012; Jones & Harris, 2014; Spillane et al., 2007). Therefore, the school leader's attitude towards leadership is important. Whereas autocratic school leaders can make decisions on their own, school leaders who employ distributed leadership are aware of the available expertise in a team, and facilitate, support, and encourage teachers to adopt leadership roles and take the initiative. Here, school leaders' and teachers' trust are an essential condition in the school climate, as trust is paramount in joint work, collegial support, and sharing knowledge, as well as in adopting and granting leadership roles (Fink, 2016).

### **Research aims and questions**

Previous studies have displayed that a working environment wherein inquiry-based working and data use are common can enhance educational change (Earl & Katz, 2006; Fullan, 2006; Krüger, 2010; Krüger & Geijsel, 2011; Schildkamp et al., 2012; Uiterwijk-Luijk et al., 2019; Uiterwijk-Luijk et al., 2017). Fullan (2006) stated that not the accountability perspective but the development perspective seems to be a main driver in building the capacity to change and in successfully realizing change. But developing and maintaining an inquiry-based working environment requires leadership, coordination and facilitation. Leadership that specifically prompts teachers to take ownership of change initiatives may be crucial in developing such

a working environment and in realizing change as well (Cranston, 2016; Spillane, 2012b). So, both inquiry-based working and distributed leadership seem essential to be able to contribute to sustainable educational change.

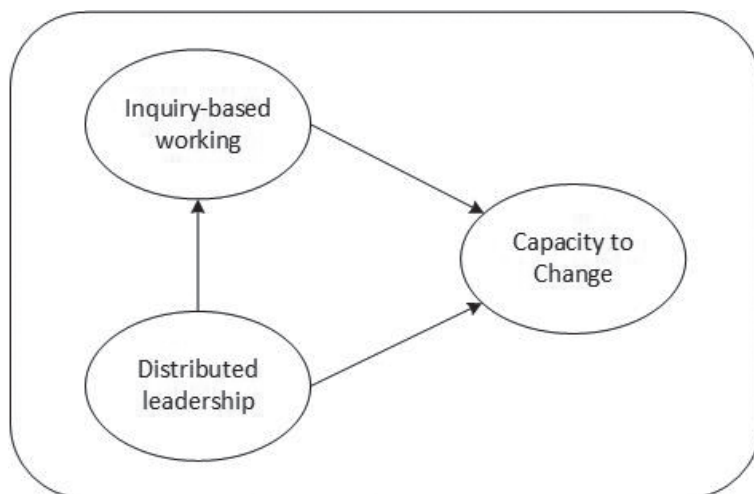
However, as Slegers & Leithwood (2010) state, in general, the attention that organization learning receives in the literature is in contrast to the amount of empirical research that is available. Many explorative studies can be found that hardly verify or falsify the relationships between variables or concepts as hypothesized in the literature. Some studies indicate that schools can indeed promote organizational learning processes, and that educational change takes place more easily in those schools. With regard to our study, more in detail, research on whether and how the three constructs, inquiry-based working, distributed leadership, and teachers' capacity to change might be reciprocally related is scarce. Also, an in-depth understanding of teachers' perceptions of inquiry-based working and distributed leadership in their day-to-day practices as well as how such a way of working might help them realize educational change, is as yet unclear.

The aim of this dissertation is to explore and provide insights into how inquiry-based working and distributed leadership relate to teachers' capacity to change. This dissertation explores the following main research questions:

1. To what extent does teachers' inquiry-based working impact their capacity to change? (Chapter 2)
2. How do distributed leadership and inquiry-based working affect teachers' capacity to change? (Chapter 3)
3. How do teachers and their school leader perceive inquiry-based working and distributed leadership to be related to realizing educational change? (Chapter 4)
4. How do primary school leaders perceive and apply the distributed leadership perspective in their schools? Furthermore, which aspects of teachers' capacity to change are more present in schools where school leaders apply a distributed leadership perspective than in schools in which such a perspective is not applied? (Chapter 5)

Figure 4 displays the assumptions underlying this dissertation.





**Figure 4.** The assumptions underlying this dissertation

### Research context

Dutch primary education serves as the research context. In the Netherlands, children aged 4–12 years old receive education arranged in eight grades. In accordance with the principle of “freedom of education,” the Dutch Constitution guarantees schools’ autonomy. Compared with education systems in other Organization for Economic Co-operation and Development (OECD) member countries, primary schools in the Netherlands operate in a highly autonomous policy context (OECD, 2018). This autonomy is reflected in schools’ policies on pedagogical, personnel, and financial management. Schools are free to choose and follow their own pedagogical visions, based on different religious, ideological, or educational convictions (Hooge, 2017), and they have the *“right of self-government—encompassing the freedom to make independent decisions—in relation to the responsibilities that are decentralized to the school”* (Neeleman, 2019, p.4).

Although the Netherlands does not have a national curriculum, there is a standardized framework with indicators included. Curricula are shaped by individual schools based on the standardized framework, though quality standards do apply to all schools. The national inspectorate is tasked with ensuring educational quality and follows a risk-based approach in which control over output results is central. If output results do not match the quality standards, schools can be asked to improve their educational quality (Ehren, Janssens, Brown, McNamara, O’Hara, & Shevlin, 2017). The output results of all schools are made public annually, in addition to the inspectorate’s reports.

Educational reform is an ongoing process, since many stakeholders, including the government, argue that restructuring is necessary to keep the educational system and school results internationally competitive and future-proof. For example, in the last two decades, primary schools were instructed to comply with quality standards, reference frameworks, results-oriented working, and curriculum reform. In the implementation of results-oriented working, which focused specifically on students' reading and math results, schools were required to withstand the external pressure that stemmed from the focus on cognitive results. Meanwhile, a trend reversal arose, which moved away from the accountability approach to the inquiry-based working approach. Inquiry-based working approaches use data and focus on broad educational development to better meet students' needs, rather than simply accounting for results (Krüger, 2010b).

During all reform processes, the inspectorate holds schools accountable for their educational quality and output results. This means that teachers' capacity to change is important. To serve the different educational needs of their students and apply the national quality standards, teachers must be able to initiate and adapt educational and instructional improvements. With regard to changing processes, inquiry-based working, distributing leadership roles, and making use of the expertise available within teams may be essential (e.g., Ross, Lutfi, & Hope, 2016; Uiterwijk-Luijk et al., 2019).

To conclude this description of the Dutch research context, it is clear that this research context differs from other educational contexts, such as for instance the American educational context (Cohen, Spillane, & Peurach, 2018).

## Method

For this study, three data sets were used. The study started with a quantitative survey. Responses were received from 963 teachers from 65 schools of which the principals had agreed to participate. After cleaning the data, a sample of 787 teachers working in 61 primary schools was generated.

A questionnaire for measuring teachers' capacity to change was developed by drawing items from or based on existing scales (Geijsel, Slegers, Van Den Berg, & Kelchtermans, 2001; Oude Groote Beverborg et al., 2015). The items used to measure inquiry-based working also were drawn from or based on existing scales (Krüger, 2010b; Schildkamp et al., 2012). Certain items were self-formulated. The scales used to measure distributed leadership were formulated from research by Spillane and Healey (2010). To determine teachers' background characteristics, the questionnaire included questions about the teachers' level of education (e.g., bachelor's or master's degree), age, gender, and years of teaching experience.

Meanwhile, the school leaders of the participating schools were interviewed by telephone. In semi-structured interviews, questions were asked about the school leaders' perceptions of the distributed leadership perspective, as well on the formal leadership distribution in their schools and their years of experience as a principal. The results of the teachers' questionnaire were used to answer our first and second research question. Supplementary to this, to provide a deeper understanding of the relationships that were quantitatively identified, a case study was performed. Following the results of the questionnaire, one school was selected based on the teachers' high scores, as we assumed that the team members adopted strong inquiry-based work practices in a context of distributed leadership. By using semi-structured interviews, 11 teachers and the school leader were interviewed.

To answer our third research question on which aspects of teachers' capacity to change are more present in schools in which school leaders perceive the distributed leadership perspective as present, we used a parallel mixed-method approach. In this approach, both quantitative and qualitative data were collected in the same research phase. Analysis of phenomena on a large scale can be facilitated by quantitative methods. Qualitative methods, on the other hand, can locate the meanings of participants connected to the context they work in (Cresswell, 2014). The results of the school leaders' interviews were combined with the results of the teachers' questionnaire. We anticipated that this mixed-method approach would yield valuable insights into how the distributed leadership perspective and inquiry-based working relate to teachers' capacity to change.

### **Outline of this dissertation**

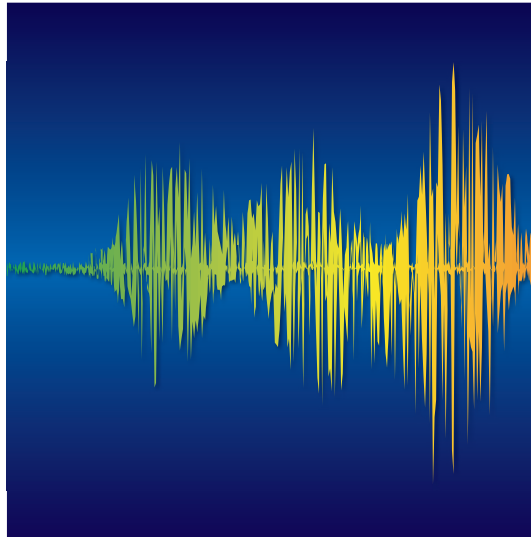
This dissertation exists out of 4 empirical chapters, that all four are based on articles published in or accepted by peer-reviewed journals. Chapter 2 explores on the impact of teachers' inquiry-based working on their capacity to change (research question 1). This study aims to quantitatively explore whether inquiry-based working enhances teachers' capacity to change with the ultimate goal of improving educational quality. Furthermore, it seeks to explore which aspects of inquiry-based working are the most important drivers of teachers' capacity to change. The results may help different stakeholders (e.g., school boards, principals, teacher educators) develop strategies for initiating school development and improving teachers' change capacity.

Chapter 3 presents the direct and indirect effects that distributed leadership and inquiry-based working have on teachers' capacity to change (research question 2). We predicted that both distributed leadership (wherein leadership is a feature of the organization instead of a single person) and inquiry-based working would exert direct, positive effects on teachers' capacity to change. We also anticipated that the positive effect of distributed leadership would be mediated by teachers' inquiry-based work practices.

Chapter 4 displays a case study wherein the findings described in chapter 3 are explored further. Here, our aim was to gain deeper insights into the underlying processes and in teachers' beliefs with regard to the relationships between inquiry-based working, distributed leadership, and realizing educational change in their daily practices (research question 3). We examine teachers' and their principal's perceptions of teachers' involvement in leadership and inquiry-based working and how they perceive the relationship between these constructs.

Chapter 5 provides insights into how primary school leaders perceive and apply distributed leadership in their schools and which aspects of teachers' capacity to change are more present in schools in which principals apply a distributed leadership perspective than in schools that do not apply such a perspective (research question 4). The aim of this study is to further examine principals' beliefs and perceptions on distributed leadership when seeking to realize educational change as a team, and how their interpretations relates to teachers' capacity to change. A parallel mixed-method approach is employed, wherein the teachers' capacity to change questionnaire is brought together with the school leaders' interviews.

Chapter 6 contains a recapitulation and discussion of the main findings. As Chapters 2, 3, 4, and 5 were published in or accepted by different journals, some sections partly overlap. The teacher questionnaire used in the Chapters 2, 3, and 5 can be found in Appendix A1 and A2. The guidelines used in the semi-structured interviews are displayed in Appendix B1 and B2 (the case study—Chapter 4) and C (the principals' interviews—Chapter 5). The questionnaire and the guidelines are displayed in Dutch. Appendix D displays the statement regarding the published or submitted manuscripts that are included in this dissertation.



# 2

## CHAPTER

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### THE IMPACT OF TEACHERS' INQUIRY-BASED WORKING ON THEIR CAPACITY TO CHANGE

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This chapter is based on: Amels, J., Krüger, M. L., Suhre, C.J.M., & Van Veen, K. (2019). Impact of inquiry-based working on the capacity to change in primary education. *Journal of Educational Change*, 20(3), 351–374.

**Abstract**

*Educational improvement projects are increasingly focused upon the significant role of data in determining student performance, teachers' learning, and schools' ability to initiate local reforms. Thus, schools are moving toward a new approach to learning, progressing from the routine to the non-routine through inquiry-based working. In addition, educational improvement requires teachers to exhibit the capacity to change, namely, to implement the innovations proposed by government agencies or the schools themselves. Therefore, the current study investigates the extent to which the inquiry-based working of primary school teachers predicts their capacity to change. Furthermore, the study identifies which aspects of inquiry-based working are the critical drivers in the capacity to change. A mixed model analysis of questionnaire data collected from a sample of 787 teachers at 61 Dutch elementary schools revealed that the central aspects of inquiry-based work (i.e., working with an inquiry habit of mind, demonstrating data literacy, using data in the classroom, and using data at the school level) are significant in promoting an increased capacity to change. Working with an inquiry habit of mind emerged as the most critical aspect. Data use in the classroom and at the school level are complementary factors that also enhance a teacher's capacity to change.*

## Introduction

Schools across the world are currently facing official demands to raise performance standards, narrow pupil performance gaps in reading and mathematics, and to provide challenges for the gifted at the same time (Deppeler & Ainscow, 2016). To initiate and implement the reforms that allow schools to meet such demands also requires that teachers develop the capacity to change their teaching and learning practices. This capacity encompasses all conditions at the school and teacher level that enhance educators' professional learning and promote advances in teaching (Hopkins, Harris, Stoll, Mackay, 2011; Thoonen et al., 2012). Strategies for school improvement often rely on the assumption that teachers are able and willing to change and that both teachers and schools have the capacity to transform. However, research confirming this capacity is limited, especially in primary education. More accurately, extant literature on school improvement has not sufficiently explored how schools enhance their educational quality or realize sustainable, long-term change (Hopkins et al., 2014; Staman, Visscher, & Luyten, 2014; Valenzuela et al., 2016).

Modern projects aimed at educational improvement tend to focus on data and their influence in determining student performance and teacher learning, along with the schools' ability to initiate local reforms and the success of these improvement efforts (Datnow & Hubbard, 2015). Data alone, however, cannot provide all the information that educators need. Educators must analyze and interpret them in order to formulate answers to urgent questions about educational quality and student outcomes (e.g., Earl & Katz, 2006; Geel et al., 2016). So-called inquiry-based working arguably generates school improvements (Datnow & Hubbard, 2015). Nonetheless, no prior research has established a relationship between teachers' inquiry-based working on the one hand, and the capacity to change on the other—even though both constructs relate to school improvement and effectiveness (Hopkins et al., 2011).

To add to the knowledge in the area of school improvement, this study investigates whether an inquiry-based disposition enhances teacher's capacity to reform and which aspects of inquiry-based working can be assumed as the most important drivers of a teacher's capacity to change. For this purpose, we chose a quantitative approach (a quantitative survey involving 787 teachers from 61 primary schools) because we were interested in exploring these general patterns and relationships, recognizing that such an approach does not allow for an in-depth exploration. Such an exploration will be the next step if meaningful patterns are found. Accordingly, in this chapter, we first define and explain teacher's capacity to change and inquiry-based working. We also describe how the relationship between these two factors is understood within the literature. Secondly, we describe the context of our study, as well as the variable measurement and our multilevel analysis approach.



Following the results, the most important findings and conclusions are presented and discussed in the final paragraph.

## **Theoretical framework**

### ***Inquiry-based working***

Global shifts in the educational environment have prompted schools to consider a new approach to learning: non-routine, rather than routine, through data use (Katz & Dack, 2014; Seashore Louis & Lee, 2016). In inquiry-based working, teachers and teams systematically collect and analyze various types of data in an effort to improve the performance of both students and schools (Marsh & Farrell, 2015). The current study adopts a holistic perspective on inquiry-based working, in line with Earl and Katz (2006) and Uiterwijk-Luijk (2017). According to this view, inquiry-based working entails working with an inquiry habit of mind, demonstrating data literacy, using data at the school level, and using data in classrooms with the goal of improving educational quality. When teachers work in an inquiry-based way, they use all the data available to enhance student outcomes (Earl & Fullan, 2003; Krüger, 2010b; Uiterwijk-Luijk et al., 2017).

Different types of data are relevant: quantitative (e.g., test results), qualitative (e.g., interviews, observation reports), input (e.g., education level, age, children's school entry), process (e.g., observational data on school improvements), satisfaction (e.g., stakeholder satisfaction surveys), and output (e.g., student outcomes). The internal data available offer insights into effective teaching and learning strategies and results. They support accountability, but even more pertinently, they highlight the need to focus on development (Brown & Greany, 2018; Earl & Fullan, 2003; Earl & Katz, 2006; Krüger, 2010a). In inquiry-based working, evidence-based information also provides insights: Teachers and school leaders rely on external research to learn about successful strategies for realizing educational improvements. Thus, inquiry-based working relies on the use of data from a variety of sources.

To work with data in ways that enable teachers to learn, teachers investigate their own practices. Therefore, data use is assumed to improve teachers' learning and development with regard to their own educational practices, such as by improving or adapting their methods of instruction to better reflect students' educational needs (Deppeler & Ainscow, 2016). In addition, as they do so collectively, the process of improving and adapting may more strongly result in meeting students' needs (Ainscow et al., 2016). According to Uiterwijk-Luijk et al. (2017), to work in an inquiry-based way, teachers must first develop an inquiry habit of mind, implying that they are curious, ask questions, and are open to engaging in deep learning. They are able to switch perspectives and discard existing routines to create new ones. Moreover, a well-developed inquiry habit of mind strengthens a teacher's sense of self-efficacy (Uiterwijk-Luijk et al., 2017).

In addition, teachers must be able to obtain meaningful information and learn from data, such that they demonstrate data literacy, or “*an ability to understand and use data effectively to inform decisions*” (Mandinach & Gummer, 2013, p. 30). Teachers who demonstrate data literacy think about the purpose of data, understand different data types and qualities, competently interpret data, and report their findings to others. They are capable of transforming data into information and then information into actionable knowledge. To do so, they need to be able to identify, collect, organize, analyze, summarize, and prioritize data. However, within this focus upon teachers' personal data interpretation and learning processes, both teachers and school leaders must also be able to acknowledge the existing potential for bias (Katz & Dack, 2014).

Consequently, teachers who adopt an inquiry-based approach use data within their classrooms to inform them of ways to adapt their instruction and learning to correspond to students' needs. Finally, such teachers also use data at the school level when considering how to enhance educational quality.

As they use these data, teachers collectively learn. They concentrate on developing higher-quality teaching methods by employing, adjusting, and adapting standards (Ainscow et al., 2016; Seashore Louis & Lee, 2016). This approach results in new insights, which then leads to new explicit knowledge at the school level. The outcomes include enhanced teaching and learning by teachers, sharper educational goals, and a stronger sense of ownership of the developments by the instructors. As deep learning takes place, reform and sustainable change occur for both individual teachers and the team as a whole (Camburn & Han, 2015; Katz & Dack, 2014). School cultures in which data use, an inquiry habit of mind, and data literacy are common can foster educational improvement and teacher professionalization (Krüger & Geijsel, 2011; Schildkamp et al., 2012). However, educational improvement requires a teacher's capacity to change to be at a particular level.

### ***Capacity to change***

Change is a process by which an old or problematic issue is adjusted and transformed, resulting in a new experience or learning (Fullan, 2016; Stoll, 2009). Within this study, change refers to a planned, systematic, purposeful, and coordinated modification, aimed at achieving educational improvements within schools (Deppeler & Ainscow, 2016). The capacity of teachers to change is defined as their capability to collaborate in developing and implementing innovations initiated by the government, the school board or the teachers themselves. The term also refers to teachers' ability to connect innovations to both the individual and collective learning processes that lead to change (Geijsel, et al., 1999; Harris, Adams, Jones, & Muniandy, 2015).

Based on Stoll (2009, 2013), Ho and Lee (2016), Geijsel et al. (1999), Geijsel et al. (2009), and Diseth et al. (2012), this study operationalizes teacher's change capacity in terms of three aspects that are all assumed to contribute to teacher's capacity to change: (1) teacher collaboration, (2) the extent to which teachers undertake professional learning activities; and (3) motivational variables, such as whether they internalize school goals as personal objectives, their sense of self-efficacy, and their job satisfaction.

Firstly, change requires collective acts, which means devoting time, effort, and energy to a learning process in order to attain certain outcomes or goals (Philpott & Oates, 2017). These joint actions require collaboration because support from and communication with colleagues is necessary to realize successful change (Hargreaves & Fullan, 2012; Ho & Lee, 2016; Mayotte et al., 2013). In line with Little (1982), teacher's capacity to change in terms of collaboration is meant as joint work. In joint work, teachers collectively find answers to educational and instructional problems and issues by sharing ideas and practices in order to develop innovative teaching methods (Meirink et al., 2010). There are several forms of collaboration—story telling, aid and assistance, sharing and joint work—with varying levels of task interdependency. At a high level of task interdependency, the task performance of one teacher is strongly dependent on the task performance of the others, which is the case in joint work. High levels of task interdependency between teachers are likely to encourage their learning through collaboration (Little, 1982, 1990; Meirink et al., 2010). Finally, collaboration is enhanced by collegial support and trust, meaning that teachers share the belief that change should be a collective endeavor (Coburn & Turner, 2011; Pogodzinski, 2014; Thoonen et al., 2011). Accordingly, this study focuses on teacher collaboration as joint work that features a high level of task interdependency and collegial support.

Secondly, teacher's capacity to change can be ascertained with reference to the undertaking of professional learning activities. As demonstrated by Borman et al.'s (2003) meta-analysis, teachers who emphasize continuous development seem to exhibit an increased capacity to change. In addition, to create a climate supporting change-oriented behavior, a learning environment is imperative (Weiner & Higgins, 2017). Thus, the way teachers undertake professional learning activities reflects their use of opportunities for active learning, as well as how they experiment with or reflect upon their own work and classroom teaching (Geijsel et al., 2009; Thoonen et al., 2011). Louws, Meirink, Van Veen, & Van Driel (2017) identify that teachers are often willing to learn about curriculum and instruction-related aspects, which are topics central to being a teacher. Consequently, when a change relates to these topics, teachers are more likely to be willing to participate. Similarly, professional learning activities that lead to change also tend to be characterized by the dissemination and adaptation of insights and experiences (Camburn & Han, 2015; Hargreaves &

Fullan, 2012; Mayotte et al., 2013). Hence, this study focuses on the extent to which teachers remain up-to-date, experiment, reflect, and share their knowledge and experiences within the team.

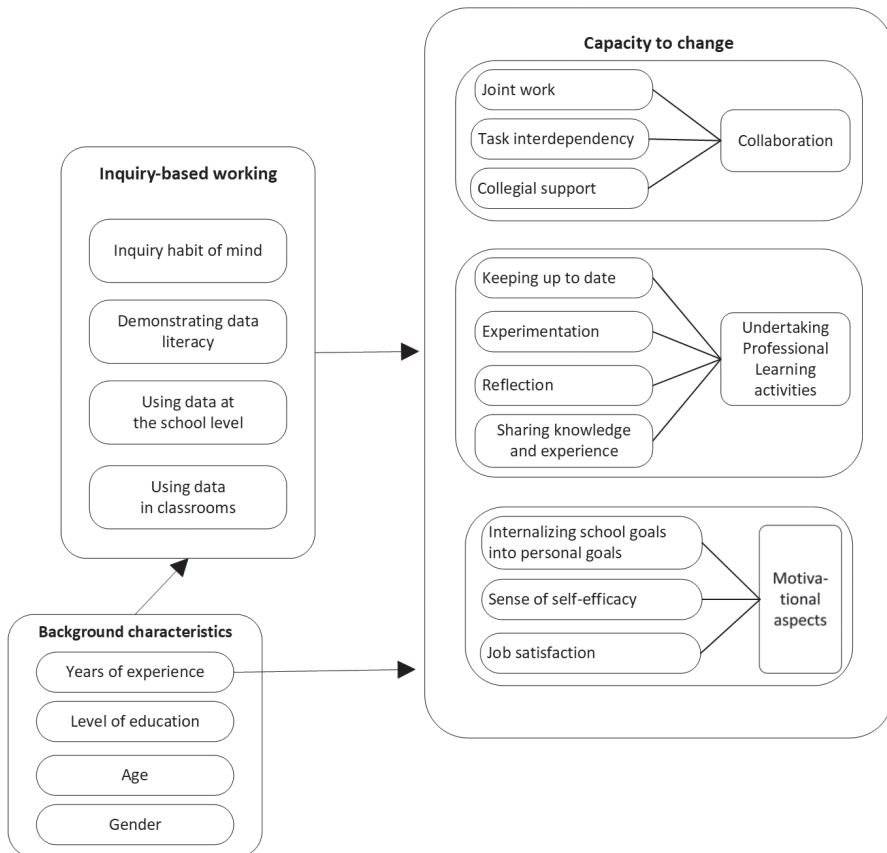
Thirdly, within teacher's capacity to change the concern of motivational factors needs to be considered, as personal goals and beliefs about capacities are foundational to the motivational processes that lead to commitment and change (e.g., Geijsel et al. 1999; Geijsel et al., 2009; Thoonen et al., 2011). Teachers seem more committed to their schools and more motivated to participate in learning processes when they have internalized the school's goals as their own (Geijsel et al., 2009). As such, attaining these personal goals encourages commitment and thus enhances teachers' contributions to change processes. Furthermore, without some particular level of self-efficacy, teachers are less inclined to contribute to change (Thoonen et al., 2011; Valenzuela et al., 2016). Teachers with stronger efficacy beliefs tend to persevere in their teaching beliefs and behaviors, even when confronted with difficulties. Such educators feel adequately equipped, experience less uncertainty, and find constructive answers more quickly (Oude Groote Beverborg et al., 2015). Committed and satisfied teachers play a vital role in helping their schools develop successfully; their higher levels of organizational commitment and job satisfaction encourage them to devote more efforts to attaining organizational goals. Job satisfaction here is meant as the result of a relaxed and positive emotional state attained within experiences within one's job (Hulpia et al., 2009). However, job satisfaction is a complex variable, influenced by both the dispositional characteristics of the employee and the situational factors of the job (Singh & Kaur, 2010). Teachers who are satisfied with their jobs are likely to demonstrate greater dedication to the organization and are willing to contribute to, and accept, change. Motivational variables—such as self-efficacy, job satisfaction, and the ability to embrace school goals as personal targets—keep teachers abreast of current trends in education and increase their willingness to apply those advances to their own teaching practices (Hulpia et al., 2009; Thoonen et al., 2012).

To develop a capacity for change, teaching skills are critical. Skills develop over time, and experienced teachers may be more capable of changing their mindsets by drawing on other perspectives (Desimone, 2009). Additionally, in the Dutch educational context, teachers at graduate school level, wherein teachers develop an inquiry habit of mind and endorse the relevance of inquiry-based working, are increasingly desired. Accordingly, background characteristics—such as the amount of teaching experience and teacher's level of education—seemingly influence the extent to which teachers work in an inquiry-based way (e.g., Kocór & Worek, 2017; Mueller, 2013; Mullola et al., 2012; Rubie-Davies, Flint, & McDonald, 2012).

To investigate the extent to which teachers' inquiry-based working explains differences in the capacity to change, the current study centered on primary schools in the Netherlands. The aim was to determine whether an inquiry-based disposition enhances teachers' capacity to transform, with the ultimate goal of improving educational quality. Accordingly, the central research questions were as follows:

1. To what extent does teachers' inquiry-based working in primary schools predict their capacity to change?
2. Which aspects of inquiry-based working are the most important drivers of teachers' capacity to change within primary schools?

Figure 1 illustrates the key concepts and how they, in line with the research questions, are assumed to be related.



**Figure 1.** The key concepts and the relationships assumed

## Method

### ***Context, participants, and procedures***

In the Netherlands, children aged 4 to 12 years participate in eight years of primary education. Education is compulsory from the age of five years. In the last year of primary education, students receive a recommendation for appropriate secondary schooling. These suggestions are partly based on the results of a national test, though parental and teacher preferences also play a role. Most Dutch primary schools are government-funded private institutions, and many have a religious affiliation. Although the Netherlands does not have a national curriculum, there is a national standardized framework with indicators included. Schools are autonomous, which means that they have the *“right of self-government—encompassing the freedom to make independent decisions—on the responsibilities that have been decentralized to schools”* (Neeleman, 2019, p. 4). This autonomy is reflected in school's policies related to pedagogical approaches, personnel, and financial management. Quality standards apply to all schools, however, and the national inspectorate is tasked with ensuring educational quality. A risk-based approach is followed, wherein control of output is central (Ehren et al., 2017). Based upon the Dutch context of an applied quality standard to all schools and the absence of a national curriculum, a teacher's capacity to change is relatively important. To serve the different educational needs of their students, teachers should be able to initiate and adapt educational and instructional improvement and, simultaneously, comply with the quality standards.

Almost 500 schools were invited by post and e-mail to participate in this study. A total of 65 schools took part, most of them located in the mid-western or eastern regions of the Netherlands. A web-based survey was sent to 1,209 teachers, all working with students between the ages of 4 and 12 years, including students with special educational needs. The questionnaire was completed by 963 teachers from April–June, 2016, representing a response rate of 79%. For 176 participants, more than 10% of the data were missing; these incomplete response sets were excluded from the analysis. A sample of 787 teachers working in 61 primary schools was, therefore, generated. The sample's gender ratio (89.4% female, 10.6% male) reflected that of the larger population of Dutch primary school teachers (87% female, 13% male; see [www.statline.nl](http://www.statline.nl)).

The demographic characteristics of the participants are summarized in Table 1. A few respondents (32%) were younger than 35 years. The grade distribution was fairly equal, and almost 70% of the teachers had bachelor's degrees. Team sizes ranged between 4 and 38 teachers, and the participation rate of the teams varied between 31% and 100%.

**Table 1** Participants' demographic characteristics (N = 787)

| Demographic Characteristic               |  | <i>n</i> | %    |
|--|--|----------|------|
| Gender                                   | Female   | 703      | 89   |
|  | Male   | 84       | 11   |
| Age at time of survey                    | <25  | 33       | 4.2  |
|  | 25–34  | 215      | 27.4 |
|  | 35–44  | 209      | 26.6 |
|  | 45–54  | 157      | 19.9 |
|  | > 55   | 170      | 21.6 |
| Years of experience in primary education | <4   | 77       | 9.8  |
|  | 5–9  | 158      | 20.1 |
|  | 10–14  | 168      | 21.3 |
|  | >15  | 383      | 48.7 |
| Class level taught                       | Grade 1 & 2                                      | 181      | 23   |
|  | Grade 3  | 90       | 11.4 |
|  | Grade 4  | 91       | 11.6 |
|  | Grade 5  | 76       | 9.7  |
|  | Grade 6  | 76       | 9.7  |
|  | Grade 7  | 77       | 9.8  |
|  | Grade 8  | 86       | 10.9 |
|  | Other function (e.g., special educational needs) | 107      | 13.6 |
| Educational level                        | No bachelor's or master's degree                 | 34       | 4.3  |
|  | Bachelor's degree                                | 549      | 69.8 |
|  | Master's degree                                  | 201      | 25.6 |

### **Variables**

To measure primary school teachers' inquiry-based working and capacity to change, the authors developed a new questionnaire with items drawn from or based on existing scales (Geijsel et al., 2001; Krüger, 2010a; Oude Groote Beverborg et al., 2015; Schildkamp et al., 2012). Certain items were self-formulated. All items pertaining to inquiry-based working and the capacity to change used 5-point Likert scales, ranging from 1 (totally disagree) to 5 (totally agree). To test for construct validity, the questionnaire was piloted with 10 primary school teachers working in grades 1 to 8 who were not otherwise involved in this research. The feedback from the pilot test was incorporated into the final questionnaire.

### ***Inquiry-based working***

The inquiry-based working questionnaire contained 22 items across four scales: working with an inquiry habit of mind (5 items, e.g., "Out of curiosity, I systematically ask questions in my work," Cronbach's alpha = .82), demonstrating data literacy

(7 items, e.g., "I am able to process and analyze collected data," Cronbach's alpha = .89), using data at the school level with the aim of improving educational quality (6 items, e.g., "To us, it is essential to analyze data on how to enhance educational quality," Cronbach's alpha = .82), and using data in classrooms (4 items, e.g., "In preparing my lessons, I use data on my students," Cronbach's alpha = .81).

### ***Capacity to change***

The capacity to change was investigated and assessed by means of multi-item scales (total of 56 items), measuring (1) teachers' collaborations, (2) the ways teachers undertook professional learning activities, and (3) three motivational variables (i.e., the extent to which teachers internalized school goals, the teachers' sense of self-efficacy, and job satisfaction).

To measure collaboration, three scales addressed joint work (6 items, e.g., "In our team, we evaluate new approaches," Cronbach's alpha = .84), task interdependency (4 items, e.g., "In our team, we need information from each other to do our jobs," Cronbach's alpha = .72), and collegial support (6 items, e.g., "My colleagues tell me about the difficulties they face in teaching and how they solve them," Cronbach's alpha = .85).

The extent to which the teachers undertook professional learning activities was measured with four scales. The first addressed the degree to which the teachers kept themselves up-to-date in the field of teaching (6 items, e.g., "I undertake initiatives on my own to ensure my own professional development," Cronbach's alpha = .86). Subsequently, the extent to which the teachers experimented (4 items, e.g., "In my lessons, I test new instructional approaches," Cronbach's alpha = .74) and reflected (5 items, e.g., "I compare my current teaching to my teaching from one year ago," Cronbach's alpha = .80) were assessed, as was the degree to which the teachers shared their knowledge and experience (6 items, e.g., "In our team, teachers share opinions and ideas about educational developments," Cronbach's alpha = .89).

Four items measured the extent to which teachers internalized school goals and generated them into personal targets (e.g., "I completely endorse our school goals and my actions support them," Cronbach's alpha = .80). Both a sense of self-efficacy (e.g., "I feel like I am successful in my work," Cronbach's alpha = .81) and job satisfaction (e.g., "I am satisfied with my job as a teacher," Cronbach's alpha = .88) were measured with 5 items each.

### ***Background characteristics***

The survey included items to measure five background traits. Gender was binary (1 = female, 2 = male). Respondents could choose from five age categories (coded



1-5): < 25 years, 25-34 years, 35-44 years, 45-54 years, or  $\geq$  55 years. The years of experience variable featured four levels: 1 = less than 4 years, 2 = 4-10 years, 3 = 10-15 years, and 4 = 15 years or more. For the educational level of the participants, 1 = no bachelor's or master's degree, 2 = bachelor's degree, and 3 = master's degree. Finally, the class level taught (grades 1-8) took the respective grade as a value, and then the option "other function (special educational needs)" was coded 9.

### ***Data analysis***

Multilevel methods were used to analyze the data. Intra-class coefficients computed for the intercept-only models illustrate the effect of clustering on the ten variables reflecting the different aspects of a teacher's capacity to change; the values range from .03 to .32. Subsequently, to assess the extent to which all four inquiry-based variables explain within-school differences in the capacity to change, multilevel analyses were performed (procedure Mixed, SPSS version 23, SPSS Inc., 2016). For each dependent variable (collaboration, undertaken learning activities, and motivational variables), the analysis calculated the difference between a model containing all four inquiry-based working variables and an empty (intercept-only) model.

The independent variables were group mean-centered because the analysis was not focused on the school level but rather on teachers' perceptions (Tabacknick & Fidell, 2013). With regard to the amount of within-school variance explained by the multilevel models, the factor of interest was the reduction in the variance within the random intercept parameters due to the inclusion of different aspects of inquiry-based working, or their combinations. Demographic characteristics served as covariates. The full model, including the four aspects of inquiry-based working and the demographic characteristics, offered a significantly better fit than one that only integrated the intercepts (see Table 2 and Appendices A 3–A5). Across the participants, the slopes did not vary. For each dependent variable, the final model differed significantly from the full model, as illustrated in Table 2. All four predictors of inquiry-based working improved the fit of the model in terms of each aspect of the capacity to change. The demographic predictors also improved the model's fit, and each contributed uniquely to each dependent variable to establish the best possible fit.

**Table 2.** Comparison of multilevel models predicting the capacity to change on the basis of inquiry-based working

|   |  | Null Model<br>M1     | Full Model<br>M2     |  | Final<br>Model M3            |  |
|---|--|----------------------|----------------------|--|------------------------------|--|
|   |  | -2 Log<br>Likelihood | -2 Log<br>Likelihood | $\chi^2$ Difference<br>Test<br>(M1 – M2) | -2 Log<br>Likelihood<br>(df) | $\chi^2$ Difference<br>Test<br>(M2 – M3) |
| Collaboration                               | Joint work                                     | 1,681.666            | 1,558.024            | 123.642 *                                | 1,544.275 (10)               | 13.749 *                                 |
|   | Task interdependency                           | 1,392.334            | 1,257.228            | 135.106 *                                | 1,239.233 (9)                | 17.995 *                                 |
|   | Collegial support                              | 1,633.292            | 1,514.190            | 119.102 *                                | 1,502.803 (10)               | 11.387 *                                 |
| Professional learning activities undertaken | Keeping up to date                             | 1,599.868            | 1,164.432            | 435.436 *                                | 1,143.395 (9)                | 21.037 *                                 |
|   | Experimenting                                  | 1,502.370            | 1,274.890            | 227.480 *                                | 1,257.773 (9)                | 17.117 *                                 |
|   | Reflecting                                     | 1,231.511            | 797.335              | 434.176 *                                | 771.204 (9)                  | 26.131 *                                 |
|   | Sharing knowledge and experience               | 1,684.678            | 1,503.729            | 180.949 *                                | 1,487.047 (10)               | 16.682 *                                 |
| Motivational variables                      | Internalizing school goals into personal goals | 1,369.280            | 1,061.133            | 308.147 *                                | 1,038.421 (9)                | 22.712 *                                 |
|   | Sense of self-efficacy                         | 1,372.718            | 1,113.230            | 259.488 *                                | 1,091.920 (8)                | 21.310 *                                 |
|   | Job satisfaction                               | 1,538.595            | 1,444.133            | 94.462 *                                 | 1,431.061 (10)               | 13.072 *                                 |

Notes: M1 df = 3; M2 df = 13.

\* $p < .01$ .

## Results

### *Descriptive statistics*

For the four aspects of inquiry-based working, the mean item scores varied between 4.17 and 4.59. The mean scores for the capacity to change aspects spanned from 3.81 to 4.47. The midpoint on the 5-point Likert scales is 3.0, so these results indicated positive, relatively high scores for all variables, as detailed in Table 3. The distribution measures revealed a moderately negative skewness for two inquiry-based working aspects; namely, data literacy and classroom data use. For the latter, a high positive kurtosis also emerged. However, skewness and kurtosis do not make a substantive difference in an analysis with a sample that is greater than 200 respondents (Tabacknick & Fidell, 2013).

**Table 3.** Descriptive results for the scales used

|                       |                                       | N  | M    | SD   | Skewness |       | Kurtosis |      |     |
|-----------------------|---------------------------------------|--|------|------|----------|-------|----------|------|-----|
|                       |                                       |  |      |      | SE       | SE    | SE       | SE   |     |
| Inquiry-based working | Working with an inquiry habit of mind | 787  | 4.17 | .59  | -1.03    | .09   | 2.03     | .17  |     |
|                       | Demonstrating data literacy           | 787  | 4.51 | .54  | -2.15    | .09   | 8.25     | .17  |     |
|                       | Data use at the school level          | 787  | 4.16 | .63  | -.88     | .09   | 1.31     | .17  |     |
|                       | Data use in classrooms                | 787  | 4.59 | .49  | -2.45    | .09   | 10.73    | .17  |     |
| Capacity to change    | Collaboration                         | Joint work                                     | 787  | 3.84 | .78      | -.93  | .09      | .54  | .17 |
|                       |                                       | Task interdependency                           | 787  | 4.33 | .58      | -1.70 | .09      | 4.33 | .17 |
|                       |                                       | Collegial support                              | 787  | 3.91 | .71      | -.80  | .09      | .82  | .17 |
|                       | Motivation                            | Internalizing school goals into personal goals | 787  | 4.47 | .59      | -1.87 | .09      | 5.70 | .17 |
|                       |                                       | Sense of self efficacy                         | 787  | 4.19 | .58      | -1.19 | .09      | 2.91 | .17 |
|                       |                                       | Job satisfaction                               | 787  | 4.31 | .69      | -1.61 | .09      | 3.52 | .17 |
|                       |                                       | Professional learning activities undertaken    | 787  | 4.20 | .67      | -1.08 | .09      | 1.44 | .17 |
|                       | Experimenting                         | 787  | 4.15 | .63  | -.92     | .09   | 1.41     | .17  |     |
|                       | Reflecting                            | 787  | 4.44 | .53  | -1.81    | .09   | 6.79     | .17  |     |
|                       | Sharing knowledge and experience      | 787  | 3.81 | .77  | -.85     | .09   | .73      | .17  |     |

Notes: 1 = totally disagree, 2 = partly disagree, 3 = neither disagree nor agree, 4 = partly agree, 5 = totally agree. M = mean item scores, SD = standard deviation, SE = standard error.

### Multilevel analysis

The next step was to examine the extent to which teachers' inquiry-based working explained differences in the capacity to change, and then determine which aspects of inquiry-based working were most critical for enhancing primary school teachers' capacity to change. The dependent variables referred to collaboration, professional learning activities undertaken, and the three motivational factors. The independent variables pertained to the aspects of inquiry-based working: working with an inquiry habit of mind, demonstrating data literacy, using data at the school level to improve educational quality, and using data in classrooms. The analysis included both the main and interaction effects.

The correlations were moderately high ( $0.5 \geq r \leq 0.7$ ). For one-sided testing, the results are significant if the  $p$ -value is less than or equal to 0.05. In the following tables, significance levels appear in bold font. To gauge the eta-squared effect sizes, this study used Cohen's (1988) values: 0.02 = small, 0.13 = medium, and 0.26 = large effect.

### Collaboration variables

Collaboration was measured using three scales: (1) joint work, (2) task interdependency, and (3) collegial support. The results in Table 4 reveal that working with an inquiry habit of mind and using data in classrooms had significant

predictive power for task interdependency; data use at the school level significantly and positively predicted joint work. Moreover, working with an inquiry habit of mind predicted collegial support to a significant degree. Demonstrating data literacy, however, was not a significant predictor of any aspect of collaboration. The eta-squared values ( $\eta^2 = 0.12-0.19$ ) were all medium-sized, implying that 12%-19% of the variance in the collaboration scores could be explained by the aspects of inquiry-based working.

The interaction between working with an inquiry habit of mind and demonstrating data literacy was a significant and negative predictor of both joint work ( $b = -0.20$ ;  $SE = 0.10$ ;  $p = 0.02$ ) and task interdependency ( $b = -0.20$ ;  $SE = 0.09$ ,  $p = 0.02$ ). Teachers working with an inquiry habit of mind were less inclined to engage in joint work when they also demonstrated data literacy.

**Table 4.** Multilevel analysis: summary of inquiry-based working variables' ability to predict collaboration variables

|                      | Intercept*             |                        | Working with an inquiry habit of mind |                        |          | Demonstrating data literacy |          | Using data at the school level |          | Using data in classrooms |          |
|----------------------|------------------------|------------------------|---------------------------------------|------------------------|----------|-----------------------------|----------|--------------------------------|----------|--------------------------|----------|
|                      | <i>b</i> ( <i>SE</i> ) | <i>b</i> ( <i>SE</i> ) | <i>p</i>                              | <i>b</i> ( <i>SE</i> ) | <i>p</i> | <i>b</i> ( <i>SE</i> )      | <i>p</i> | <i>b</i> ( <i>SE</i> )         | <i>p</i> | <i>b</i> ( <i>SE</i> )   | <i>p</i> |
| Joint work           | 3.88(.06)              | .06(.04)               | .18                                   | -.05(.05)              | .33      | .13(.05)                    | .01      | .07(.06)                       | .24      | .12                      | .12      |
| Task interdependency | 4.35(.03)              | .25(.04)               | .00                                   | .01 (.05)              | .79      | .00(.05)                    | .97      | .16(.06)                       | .00      | .19                      | .19      |
| Collegial support    | 3.94(.05)              | .13(.04)               | .00                                   | .02(.05)               | .76      | .01(.05)                    | .78      | .08(.06)                       | .17      | .13                      | .13      |

Notes: *b* = regression coefficient; *SE* = standard error;  $\eta^2$  = eta squared.

\*All intercepts are significant ( $p < .00$ ).

### Professional learning activities variables

Undertaking professional learning activities involved four scales: (1) keeping up to date, (2) experimenting, (3) reflecting, and (4) sharing knowledge and experience. As displayed in Table 5, working with an inquiry habit of mind and demonstrating data literacy significantly predicted keeping up-to-date, whereas working with an inquiry habit of mind and using data in classrooms both significantly predicted experimenting and reflecting. Moreover, working with an inquiry habit of mind and using data at the school level significantly predicted sharing knowledge and experience. According to these results, working with an inquiry habit of mind was a significant and positive predictor of all aspects related to undertaking professional learning activities. The eta-squared values ( $\eta^2 = 0.19-0.44$ ) were medium or large, such that 19%-44% of the variance in the professional learning activities scores could be explained by inquiry-based working.

A positive interaction effect emerged between working with an inquiry habit of mind and using data at the school level; together, the two variables predicted reflecting ( $b = 0.17$ ;  $SE = 0.07$ ,  $p = 0.02$ ). The interaction between working with an inquiry habit of mind and using data at the school level ( $b = -0.18$ ;  $SE = 0.08$ ,  $p = 0.03$ ) significantly and negatively predicted sharing knowledge and experience. Teachers using data at the school level were more willing to reflect when they also had an inquiry habit of mind. However, those educators were also less inclined to share their knowledge and experience.

**Table 5.** Multilevel analysis: summary of inquiry-based working variables' ability to predict professional learning activities variables

|                                  | Intercept *            | Working with an inquiry habit of mind |          | Demonstrating data literacy |          | Using data at the school level |          | Using data in classrooms |          |          |
|----------------------------------|------------------------|---------------------------------------|----------|-----------------------------|----------|--------------------------------|----------|--------------------------|----------|----------|
|                                  | <i>b</i> ( <i>SE</i> ) | <i>b</i> ( <i>SE</i> )                | <i>p</i> | <i>b</i> ( <i>SE</i> )      | <i>p</i> | <i>b</i> ( <i>SE</i> )         | <i>p</i> | <i>b</i> ( <i>SE</i> )   | <i>p</i> | $\eta^2$ |
| Keeping up to date               | 4.20 (.03)             | .65 (.04)                             | .00      | .15 (.05)                   | .00      | .05 (.04)                      | .24      | .06 (.05)                | .30      | .43      |
| Experimenting                    | 4.16 (.03)             | .40 (.04)                             | .00      | .04 (.05)                   | .49      | -.04 (.05)                     | .45      | .18 (.06)                | .00      | .25      |
| Reflecting                       | 4.46 (.02)             | .35 (.03)                             | .00      | .04 (.04)                   | .34      | .04 (.03)                      | .28      | .17 (.04)                | .00      | .44      |
| Sharing knowledge and experience | 3.86 (.05)             | .13 (.04)                             | .00      | -.01 (.05)                  | .82      | .13 (.04)                      | .00      | .00 (.05)                | .96      | .18      |

Notes: *b* = regression coefficient; *SE* = standard error;  $\eta^2$  = eta squared.

\*All intercepts are significant ( $p < .00$ ).

### Motivational variables

The motivational variables, related to the capacity to change, involve the extent to which teachers internalize school goals, their sense of self-efficacy, and their job satisfaction. Table 6 illustrates the ability of the inquiry-based working variables to predict these motivational variables. Working with an inquiry habit of mind, using data at the school level, and using data in classrooms were significant, positive predictors of internalizing school goals as personal aims. A teacher's sense of self-efficacy was significantly, positively predicted by working with an inquiry habit of mind, demonstrating data literacy, and using data in classrooms. The eta-squared values ( $\eta^2 = 0.11$ - $0.32$ ) were medium or large, so 11%-32% of the variance in the motivational variable scores was explained by inquiry-based working. However, none of the four aspects of inquiry-based working was a significant predictor of job satisfaction. Moreover, no interaction effects emerged between the aspects of inquiry-based working and the motivational variables.

**Table 6.** Multilevel analysis: summary of inquiry-based working variables' ability to predict motivational variables

|  | Intercept *            | Working with an inquiry habit of mind |          | Demonstrating data literacy |          | Using data at the school level |          | Using data in classrooms |          |          |
|--|------------------------|---------------------------------------|----------|-----------------------------|----------|--------------------------------|----------|--------------------------|----------|----------|
|  | <i>b</i> ( <i>SE</i> ) | <i>b</i> , ( <i>SE</i> )              | <i>p</i> | <i>b</i> ( <i>SE</i> )      | <i>p</i> | <i>b</i> ( <i>SE</i> )         | <i>p</i> | <i>b</i> ( <i>SE</i> )   | <i>p</i> | $\eta^2$ |
| Internalizing school goals into personal goals | 4.52 (.03)             | .20 (.03)                             | .00      | .04 (.04)                   | .39      | .10 (.04)                      | .01      | .14 (.05)                | .00      | .32      |
| Sense of self-efficacy                         | 4.22 (.03)             | .16 (.04)                             | .00      | .19 (.04)                   | .00      | .03 (.04)                      | .49      | .13 (.05)                | .01      | .30      |
| Job satisfaction                               | 4.36 (.05)             | -.00 (.04)                            | .95      | -.03 (.05)                  | .48      | -.05 (.04)                     | .23      | .05 (.05)                | .31      | .11      |

Notes: *b* = regression coefficient; *SE* = standard error;  $\eta^2$  = eta squared.

\*All intercepts are significant ( $p < .01$ ).

A teacher's level of education provided a significantly positive predictor of keeping up to date ( $b = 0.058$ ,  $SE = 0.02$ ,  $p = 0.009$ ). Teachers with a master's degree were more willing to keep abreast of new knowledge and educational developments than were instructors without one. The teacher's education level was also a significant, negative predictor of joint work ( $b = -0.006$ ,  $SE = 0.02$ ,  $p = 0.001$ ), collegial support ( $b = -0.098$ ,  $SE = 0.03$ ,  $p = 0.001$ ), sharing knowledge and experience ( $b = -0.14$ ,  $SE = 0.03$ ,  $p < 0.001$ ), internalizing school goals ( $b = -0.06$ ,  $SE = 0.02$ ,  $p = 0.01$ ), and job satisfaction ( $b = -0.07$ ,  $SE = 0.03$ ,  $p = 0.007$ ). That is, teachers who had attained a master's degree were less inclined to exhibit these aspects of a capacity to change.

As the results in Table 7 demonstrate, the model was capable of explaining within-school differences among teachers. Regarding aspects of the capacity to change, 18%-48% of the within-school variance could be explained by the inquiry-based working variables.

**Table 7.** Variance in capacity to change explained by inquiry-based working within schools

|   |  | $R^2$<br>within<br>schools |
|---|--|----------------------------|
| Collaboration                               | Joint work                                     | .18                        |
|   | Task interdependency                           | .20                        |
|   | Collegial support                              | .18                        |
| Professional learning activities undertaken | Keeping up to date                             | .47                        |
|   | Experimenting                                  | .27                        |
|   | Reflecting                                     | .48                        |
|   | Sharing knowledge and experience               | .26                        |
| Motivational variables                      | Internalizing school goals into personal goals | .38                        |
|   | Sense of self-efficacy                         | .33                        |
|   | Job satisfaction                               | .15                        |

## Discussion

This study sought to investigate how and to what extent teachers' inquiry-based working predicts their capacity to contribute to change. The answers to these questions can help different stakeholders to develop strategies for initiating school reforms and improving the change capacity of teachers. The teacher's change capacity was operationalized in terms of three aspects: (1) teachers' collaborations, (2) the extent to which teachers undertake professional learning activities, and (3) motivational variables. Each aspect was divided into several sub-aspects.

Regarding our first research question, '*To what extent does teachers' inquiry-based working in primary schools predict their capacity to change?*', we found that all the inquiry-based working variables—working with an inquiry habit of mind, demonstrating data literacy, data use at the school level, and data use in classrooms—were significant drivers, promoting an increased capacity to change among teachers. Together they have a relatively great impact on teacher's change capacity. Thus, inquiry-based working is of great importance with respect to reinforcing the capacity to change within primary schools. Hence, schools can focus on enhancing the inquiry habit of mind and data literacy of their teachers, along with their use of data in classrooms and at the school level. If teachers work in such a way, they are likely to collaborate, learn, have a high sense of self-efficacy, and feel motivated to try to accomplish the school's goals. Whereas Seashore Louis and Lee (2016) in their research suggested that in a culture in which data use is a common and shared activity teacher professionalization emerges, in our study, we adopted data use related to inquiry-based working, which is a much broader approach. In this approach, besides having skills to work with data, an inquiry-based attitude is essential. Such an attitude is reflected in working with an inquiry habit of mind which means that these teachers are curious, ask questions, and base their rational judgements on facts, use data in order to learn and adapt new instructional practices. Consequently, an inquiry habit of mind together with data use stimulates teachers to reflect upon and learn from data, and, therefore, offer guidance for classroom practices. Against this background, change is not something that happens to teachers. On the contrary, teachers can initiate change and adapt their instructional strategies, based on facts and knowledge. Thus, it is worthwhile to encourage schools and teams to collectively work in an inquiry-based way as this may reinforce teachers' capacity to change, which can lead to an enhanced educational quality and strengthened opportunities to meet students' needs.

In the current study, the participants scored relatively high on almost all scales for inquiry-based working and the capacity to change, which may have been caused by the fact that schools that have already adopted an inquiry-based approach may have been more interested in participating in this study than other schools would have been. However, as the purpose of this study was to relate teachers' inquiry-

based working to their capacity to change, this might be called an advantage: we needed such schools to investigate this relationship.

With regard to our second research question, '*Which aspects of inquiry-based working are the most important drivers of a teacher's capacity to change in primary schools?*', we found that working with an inquiry habit of mind appeared to be the most important driver in reinforcing teachers' capacity to change. Teachers who work with an inquiry habit of mind like to collaborate with colleagues, exhibit a high level of professional learning, internalize school goals into personal aims, and have a high sense of self-efficacy. Whereas Brown and Greany (2018) displayed that school leaders should stimulate and support teachers' abilities to work with data, our findings showed that data literacy has very little influence on their capacity to change; it only leads to keeping up-to-date and self-efficacy. Our study reveals that working with an inquiry-habit of mind is of much more importance than teachers being data literate. With this finding, we add on research of Krüger (2010a). She states that though it is not necessary for all teachers to conduct research themselves or to be data literate, they must work with an inquiry habit of mind. Therefore, school leaders could stimulate their teachers to utilize their curiosity and retain an open mind to new perspectives, for such an attitude appeals to their inquiry habit of mind.

We also found data use at the school and classroom levels to be key aspects of inquiry-based working. Teachers who frequently use data at the classroom level may express a higher sense of task interdependency, tend to learn through experimentation and reflection and to internalize school goals. Moreover, their sense of self-efficacy seems to increase. In particular, using data in the classroom is crucial for the realization of evidence-based improvements in teaching strategies. Using data at the school level enhances the capacity to change as well. It appears to reinforce the likelihood of teachers to internalize school goals as well as their tendency to share their knowledge and experience and work jointly. Whereas the literature indicates that collaboration is essential in realizing change (e.g., Hargreaves & Fullan, 2012; Harris et al., 2015; Ho & Lee, 2016), our findings disclose that both individuality and collectivity are needed to foster a capacity to change. In a sense, data use at the school level and at the classroom level seem to be complementary factors that supplement each other's ability to affect a capacity to change. Their complementarity is understandable, in that data use at the school level influences teamwork, while data use in the classroom, experimentation, reflection, a sense of self-efficacy, and the internalization of school goals into personal goals are all based on individual teacher actions (Earl & Katz, 2006).

In contrast with our supposition, teacher's job satisfaction was not predicted by any aspect of inquiry-based working. An explanation for this may be found in the fact that job satisfaction is a complex variable, influenced by both the dispositional



characteristics of the individual and the situational factors of the job (Singh & Kaur, 2010). However, in the current study, the measurement of job satisfaction did not integrate situational factors. Therefore, caution is required with respect to this finding.

Supplementary to our research questions, we found some interaction effects. First, working with an inquiry habit of mind and demonstrating data literacy negatively interacted with joint work and task interdependency. It appears that teachers who work with an inquiry habit of mind and who also demonstrate data literacy, are less inclined to engage in joint work featuring interdependent tasks. We identified that working with an inquiry habit of mind, teacher's capability to reflect, self-efficacy, and the extent to which teachers internalize school goals into personal goals relate to the characteristics of individual teachers. In contrast, joint work and task interdependency require shared capabilities. Furthermore, the results from the current study reflect the teachers' own perceptions, which can be called a limitation. (Schwartz, 1999). It is also important to emphasize that the methods used in this study were not intended to find causal relationships. This means caution is advised regarding the findings and the interpretations.

As a second negative interaction effect, it seems that teachers with an inquiry habit of mind, who use data at the school level, do not tend to share knowledge and experiences with others. However, teachers working with an inquiry habit of mind appear to be more reflective upon their own actions and behavior when they also use data at the school level. It may be the case that teachers working with an inquiry habit of mind and demonstrating data literacy believe that they are able to interpret the data they collect and that they can give feedback to themselves. In this way, these educators may feel autonomous. Autonomy is a facet of an internal condition, and, as such, it relates to the motivational variables (Little, 1990). For teachers with a strong sense of autonomy, this trait may lead to stand-alone behavior rather than collaboration. These teachers may believe that they do not need feedback from their colleagues to verify their way of working. On the other hand, considering the positive interaction between teacher's inquiry habit of mind, data use, and teacher's reflectivity, it seems that when a teacher's reflective process is based on curiosity and data, their reflection may even more strongly alter their mindsets by drawing on other perspectives, which is in line with the findings of Desimone (2009). School leaders could use this positive interaction by providing teachers with challenging tasks. Such challenging and innovative work requires reflectivity and may enhance teacher's capacity to change even further.

With respect to the background characteristics—gender, age, teacher's level of education and experience—we found that education level seemed to offer positive predictors of a teacher's willingness to stay abreast of developments in the field. As such, it appears to be relevant to stimulate teachers to obtain a higher

education level, for instance a masters' degree, for more education generally increases teacher's professional capital (Kocór & Worek, 2017). All other background characteristics did not relate significantly to any of the aspects of inquiry-based working. This finding conflicts with findings by Mullola et al. (2012), Rubie-Davies et al. (2012), and Mueller (2013). They found that these characteristics might influence teachers' inquiry-based working. Our findings, on the other hand, support the findings of Uiterwijk-Luijk et al. (2017) that age and gender have no significant relationship to any aspect of teacher's inquiry-based working.

### **Implications for educational practice and policy**

Because of the ongoing theme of raising performance standards, teachers need capacity to change in order to adapt their teaching and learning practices. Our study reveals that inquiry-based working strongly predicts teacher's capacity to change and that working with an inquiry habit of mind is the strongest driver along with data use at school and classroom level. However, we performed our study in the field of Dutch primary education. In the Netherlands schools are autonomous, although the accountability and output control are still leading (Ehren et al., 2017; Neeleman, 2019). Dutch schools differ from schools in other countries in the extent of their autonomy. Therefore, when describing the implications for educational practice and policy, we distinguish between implications for the Netherlands and for other countries.

First, in the Dutch system, our framework of inquiry-based working and teacher's capacity to change is useful for both school leaders and teachers and for educators of leaders and teachers. Stimulating teachers to work inquiry-based, teaching them how to adopt an inquiry habit of mind, and collectively using data at the classroom and school level may reinforce teacher's capacity to change. In this way, teachers may change their teaching strategies in order to meet their students' educational needs. As such, schools can deliberately exploit and benefit from the autonomy offered, and vice versa, such a schools' autonomy enables schools to work inquiry-based. Meanwhile, the Dutch governmental approach is still based on output control and ranking, which may lead to competition between schools and, for instance, teaching to the test (Hadfield & Ainscow, 2018). Based on our framework and results, we suggest that along with the output control the national inspectorate will also utilize contextual methods of evaluations. As such, teachers can use their ability to prioritize and make choices in their own contextual practices, whereas their decisions in the adjustments of teaching and learning strategies are based on facts and knowledge.

Second, although the autonomy in Dutch schools differs from the educational systems in many other countries all over the world, the findings might be useful for schools, governments and policy makers in other countries, because our study shows that in a system of schools' autonomy teams focus on educational

development by means of inquiry-based working. Therefore, without abandoning the accountability approach, governments and policy makers worldwide could consider granting schools a certain extent of autonomy. Since schools are operating in different regions, cities and contexts, schools are confronted with different demands of students' needs. A certain degree of autonomy may appeal to teachers' creativity and offers them opportunities to adapt their teaching and learning strategies to their specific context. In such a context of schools' autonomy, teachers may feel capable of moving forward and meeting the demands of adjusting their teaching practices to serve the different needs of their students. Inquiry-based working could stimulate teachers to collaborate and might enhance their sense of self-efficacy.

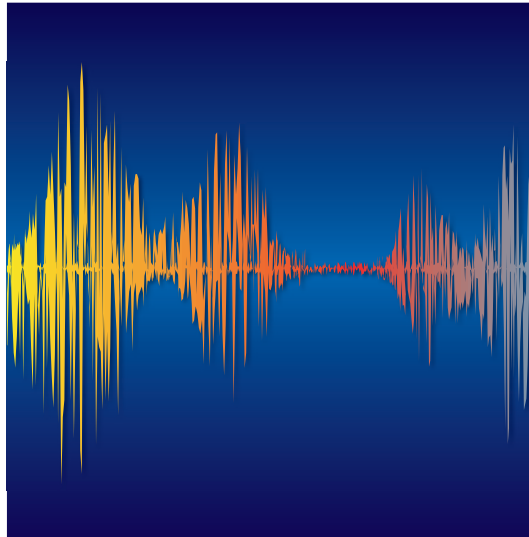
Data use for both educational development and accountability requires courage from teachers and school leaders. Therefore, we underpin the importance of trust from the government in school's capabilities to realize educational growth and development. In line with Fink's (2016) statements about trust, we emphasize that confidence of the government and the inspectorate in schools and trust within schools might be a key factor in realizing educational changes through an inquiry-based way of working. Trust may contribute to teachers' and school leaders' courage.

In our study, accountability and schools' autonomy seem to be relevant variables. By adding these variables to our framework, future research might give more insight in differences between countries according the relationship between inquiry-based working and teacher's capacity to change. Besides, our quantitative approach did not provide detailed insights into how teachers practice and experience inquiry-based working. It would be useful to identify how teachers give meaning to inquiry-based working and to the relationship between inquiry-based working and the realization of educational changes. Therefore, the next step should be to explore these patterns in a more qualitative way.

## **Conclusions**

This study enriches our understanding of inquiry-based working and how teacher's change capacity links in with conditions in this way of working. From a theoretical perspective, our findings offer new insights in how inquiry-based working is related to the capacity to change of primary school teachers. Valuable conclusions can be drawn about the reinforcement of teacher's capacity to change, which we operationalized in terms of collaboration, professional learning activities, and motivational variables. First, inquiry-based working strongly appears to predict teacher's capacity to change, which means that these teachers seem to be likely to collaborate, initiate their own professionalization, have a high sense of self-efficacy, and feel motivated to contribute to achieve the school's goals.

Second, herein, the most important driver seems to be working with an inquiry habit of mind. A strong inquiry habit of mind might serve teacher's inclination to collaborate and obtain a high level of professional learning. Also, such a habit may contribute to teacher's sense of self-efficacy and their internalization of school goals into personal goals. In addition, as we found data use at the school level and in classrooms to be complementary, data use at these two levels also is an important driver. Both individuality and collectivity are valuable in fostering teacher's capacity to change. A higher teacher's education level such as a master's degree seems to offer positive predictors of a teacher's willingness to stay abreast of educational developments. Finally, as working with an inquiry habit of mind and data literacy may interact with joint work and sharing knowledge and experiences, school leaders could encourage and support collaborative inquiry. Also, they could promote a positive attitude towards inquiry-based working and emphasize its benefits for the educational quality at classroom and school level, as well as for teachers' well-being. Ultimately, a school team that works in an inquiry-based way is able to make its own substantiated educational choices in order to meet the different needs of their students.



# 3

## CHAPTER

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### THE EFFECTS OF DISTRIBUTED LEADERSHIP AND INQUIRY-BASED WORKING ON TEACHERS' CAPACITY TO CHANGE

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This chapter is based on: Amels, J., Krüger, M. L., Suhre, C.J.M., & Van Veen, K. (2020). The effects of distributed leadership and inquiry-based work on primary teachers' capacity to change: Testing a model. *School Effectiveness and School Improvement*, DOI: 10.1080/09243453.2020.1746363

**Abstract**

*This chapter studies the relationship between teachers' perceptions of distributed leadership and inquiry-based work in primary schools and the resulting impact on those teachers' capacity to contribute to educational change. The path analysis that tests the proposed model relies on questionnaire data collected from 787 teachers in 61 primary schools. The results indicate a direct, positive effect of distributed leadership on teachers' collaboration and collegiality, as well as their motivation to contribute to educational change. Inquiry-based work positively mediates the effect of such leadership styles on three aspects of teachers' capacity to change: collaboration, professional learning activities, and motivational factors. Therefore, all three promising aspects can be reinforced if teachers adopt leadership roles and combine these roles with inquiry-based work practices.*

## Introduction

Schools worldwide confront demands to improve their instructional practices and better serve the needs of different students. To meet these demands, they need teachers who possess strong skills to monitor, develop, and adapt their own teaching methods continuously. Reinforcing teachers' capacity to change is challenging though; it likely requires an inquiry-based approach to working (Deppeler & Ainscow, 2016). Teachers who work according to an inquiry-based method systematically collect, analyze, and interpret various types of available data to improve the educational quality they provide and maximize the potential and capabilities of their students and schools. It also enables teachers to adapt their instruction and learning to students' needs (Earl & Katz, 2006).

Developing and maintaining an inquiry-based work practice in turn requires strong coordination. Leadership may be crucial, in that school leaders can organize, encourage, and facilitate inquiry-based work by prompting teachers to perceive their ownership of the change process (Seashore Louis & Lee, 2016). Leadership in this sense is a feature of the organization, rather than a single person, so we approach it from a distributed perspective, focusing on both formal and informal leadership methods, how leadership roles shift and get appropriated, and how such a distributive infrastructure might be supported by relevant teams (Spillane, 2012a). Research on the role of leadership in primary schools that encourages teachers to work in an inquiry-based way is scarce (Cranston, 2016; Uiterwijk-Luijk, et al., 2017). We adopt the distributed perspective to explore how leadership and inquiry-based work together might affect teachers' capacity to change.



## Theoretical framework

### *Teachers' Capacity to Change*

The *capacity to change* is the degree to which people can develop and implement innovations; for teachers, those new ideas might come from the government, the school board, or the teachers themselves. It also implies educators' ability to connect these innovations to individual and collective learning processes that in turn lead to further change (Geijsel et al., 1999; Harris et al., 2015). Engaging in educational change generally requires a collegial work setting, in which teachers can discuss their practices and provide interpersonal support, which enhances their connection to common goals, self-confidence, and job satisfaction (Heck & Hallinger, 2009; Thoonen et al., 2012). Accordingly, we investigate three elements underlying teachers' capacity to change: (1) collaboration, (2) participation in professional learning activities, and (3) motivational factors.

First, teachers' capacity to change through collaboration implies their readiness to engage in joint work. According to Little (1982), joint work features high levels of task interdependency; it is a far-reaching configuration of collaboration, unlike storytelling, aid, assistance, and sharing, which constitute lower levels. Joint work means that teachers collectively engage in instructional planning and solve problems by exchanging experiences, ideas, and methods, such that they develop shared, innovative teaching practices (Meirink et al., 2010). It also encourages teacher learning. Task interdependency in this context refers to teachers' perceptions of the extent to which the task performance of one team member depends on the task performance of others (Runhaar, Konermann & Sanders, 2013). In work settings, teachers need their colleagues to stand behind them, respect their opinions, and support them when problems occur; change requires that teachers join forces (Van Geel, Visscher, & Teunis, 2017; Geijsel et al., 1999).

Second, when they engage in professional learning activities, teachers stay informed about new developments and new issues in teaching practices (Thoonen et al., 2011). Teachers who undertake such activities also dare to experiment, share knowledge, and can reflect better on their own functioning (Camburn & Han, 2017; Geijsel et al., 2009). Therefore, they also are more capable of change.

Third, teachers' capacity to change depends on motivational factors. A positive emotional state—manifested as job satisfaction and a strong sense of self-efficacy—along with an ability to embrace school-level goals as personal objectives reinforces teachers' awareness of current educational trends and fortifies their inclination to investigate and apply these developments to their classroom practices (Geijsel et al., 2009; Kapa & Gimbert, 2018). In turn, teachers should be more motivated to participate in learning and changing. Teachers with strong efficacy beliefs also

experience a sense of "yes, I can" with regard to their work (Pajares, 1996), such that they tend to be more persistent and find helpful solutions more readily, reflecting the task- and situation-specific nature of self-efficacy perceptions. That is, people apply these perceptions to certain goals (Pajares, 1996). Teachers' sense of self-efficacy, job satisfaction, and the extent to which they internalize school goals thus likely relate to their ability to change (Geijsel et al., 2009; Hulpia et al., 2009; Kapa & Gimbert, 2018).

### ***Leadership and a distributive perspective***

The success of educational changes also depends on the degree of autonomy teachers have to innovate and be creative. Leadership that enables teachers to use their educational expertise, affinities, and creativity is a key factor for the success of educational changes (e.g., Buske, 2018; Seashore Louis & Lee, 2016). When leadership reflects a distributive perspective, it can foster commitment, such that the more leadership is distributed in a school, *"the more likely it is that everyone will get a chance to use their talents fully and the more committed everyone is likely to be"* (Williams, 2009, p. 32).

In a review of the literature, Tian et al. (2016) showed that no consensus definition of distributed leadership exists, though some core elements distinguish it from other leadership concepts. That is, distributed leadership implies that leadership in the organization entails a dynamic, interactive process among individuals who form groups. Their objective is to lead and influence one another to accomplish the school's goals. This process involves both upward and downward hierarchical influences. As such, distributed leadership refers to the leadership infrastructure at the school level, and the context defines how leadership is distributed, to whom, and by whom (Spillane, 2012a; Spillane & Healey, 2010).

Depending on the problems that need to be addressed, different teachers might take responsibility and provide leadership (Spillane, 2012a). In particular, some team members might take formal roles that imply leadership; they constitute the leadership team (Spillane, 2012a). Other team members instead may have informal leadership roles, because they are the best equipped or most skilled when it comes to realizing some particular goal or organizational necessity. Thus, even in a distributed leadership context, a formal leader still has an important function. Using established trust, this leader leverages the teachers' expertise and affinities and encourages them to exercise responsibility. He or she also initiates and orchestrates the necessary conditions in the school structure and culture for distributed leadership to succeed (Harris, 2014).

Collective decision-making in turn reflects how the leadership is distributed; all team members' contributions to educational improvement at the school level must

be taken into account (Heck & Hallinger, 2009). In this way, leadership is a collective characteristic of the whole team, and the team's emphasis is on interactions among leaders and followers, rather than individual actions. In such interactions, leaders' and followers' roles change constantly, in a simultaneous, ongoing influence process, because team members possess various forms of specific knowledge and expertise (Spillane & Healey, 2010). Accordingly, we investigate distributed leadership by examining the extent to which formal and informal leaders share authority and execute their leadership roles.

### ***Inquiry-based work***

With inquiry-based work, teachers systematically collect and analyze various data (e.g., quantitative, qualitative, input, output, process, satisfaction-related) that can suggest ways to maximize the potential and capabilities of students and schools (Marsh & Farell, 2015). They also consult evidence-based information to acquire insights into effective teaching and learning strategies. These data support accountability, which is a global requirement for school development. However, the data are raw and unprocessed, so teachers also need to be able to transform them into information and knowledge; knowledge based on data highlights the need to focus on development. Teachers' ability to prioritize specific aspects of their teaching practices then increases, because inquiry-based work offers insights into effective teaching and learning strategies (Earl & Katz, 2006; Faber, Glas, & Visscher, 2018; Krüger, 2010b).

As Earl and Katz (2006) and Uiterwijk-Luijk et al. (2017) propose, inquiry-based work involves four key elements: (1) working with an inquiry habit of mind, (2) demonstrating data literacy, (3) using data at the school level to improve educational quality, and (4) using data in classrooms. Teachers who *work with an inquiry habit of mind* are curious, ask questions, and engage in deep learning. They are aware of their routines and can shift to new perspectives (Earl & Katz, 2006). *Data literacy* implies an ability to comprehend and use data to make informed decisions. Therefore, teachers need skills to objectively collect, organize, analyze, summarize, and prioritize data (Mandinach & Gummer, 2013). When they *use data at the school level*, teachers collectively review data and learn how to reinforce educational quality, which results in new understanding. As such, working in an inquiry-based way leads to deeper learning across the school, which supports reform and change (Bangs & Frost, 2016; Van Gasse, Vanlommel, Vanhoof, & Van Petegem, 2017; Katz & Dack, 2014). By *using data in their classrooms*, teachers also can adapt their instruction and learning to student needs, based on the available data (Earl & Katz, 2006).

Thus, inquiry-based work supports the development of knowledge, skills, and collaborative efforts, and it leads to collective learning (Earl & Katz, 2006; Seashore

Louis & Lee, 2016). Available data induce teachers to reflect on ongoing routines, such that they develop higher-quality teaching methods by absorbing, improving, and adapting new strategies. In this way, their capacity to change and their feelings of empowerment become enhanced, especially if those teachers also have the authority to make changes (Park & Datnow, 2009).

### ***Background characteristics***

Engaging in distributed leadership and inquiry-based work may require certain characteristics of teachers, such as job qualifications. Most teachers earn at least a bachelor's degree, some have master's degrees, and a very small percentage of teachers have no university degrees at all. In our study setting, Dutch educational authorities recently have assigned more importance to primary teachers' education levels. That is, in the past teachers mainly received a bachelor's degree after undergoing vocational training in a university of applied sciences. Today though, schools seek candidates with graduate degrees, anticipating that teachers with master's degrees have developed an inquiry habit of mind and thus will be better able to apply new knowledge in action and contribute to educational development at the school level (Frost, 2012). They also should possess data literacy skills and recognize the importance of inquiry-based work. Teachers with more education also might be more interested in complex innovative operations that require research and discovery, which may increase their preference to work jointly with colleagues with similar interest in complex tasks or processes (Jaquith, 2013).

According to Day, Sammons, Stobart, Kington, and Gu (2007), as they gain experience, teachers move through several concerns. In early phases, their focus shifts from the self to the task, and then later—generally after at least 15 years of teaching experience—expert teachers experience comfort in their role and confidence in their abilities. In this phase, teachers may be more interested in learning about role effectiveness and experimenting with new teaching methods (Kyndt, Gijbels, Grosemans, & Donche, 2016). However, Richter, Kunter, Klusmann, Lüdtke, & Baumert (2011) indicate that more experienced teachers may be less interested in professional learning activities related to subject content, pedagogies, or psychology.

Another personal characteristic that might exert an effect is the gender of the teachers. Rubie-Davies et al. (2012) study the links of gender with teacher efficacy and goal orientation and find that female teachers tend to express stronger feelings of efficacy related to new instructional strategies and classroom management, whereas male teachers often are more performance oriented and exhibit higher levels of task interdependency. The substantial gender gap in many school teams—in many countries, men are strongly underrepresented in education—might produce a distorted view though (Mistry & Sood, 2016).

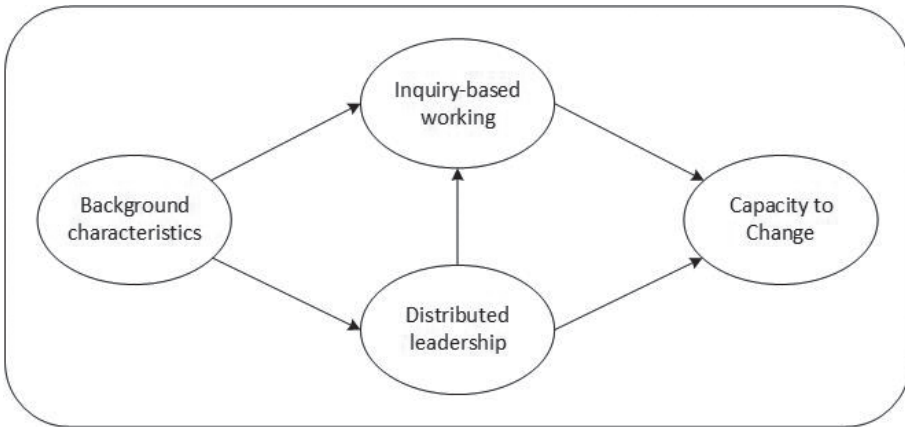
In the Dutch primary education context, second-career teachers have become very common. Therefore, it is not appropriate to assume that years of teaching experience correlate precisely with teachers' age. Instead, we follow Richter et al. (2011) and predict that older teachers may be more likely to take leadership roles. We use teachers' age as another background characteristic.

### **Study overview**

As the preceding discussion reveals, extant empirical research suggests that leadership with a distributed perspective and inquiry-based work relate to teachers' capacity to change; however, this relationship has not been thoroughly investigated. It remains unknown whether and how distributed leadership and inquiry-based work might influence, directly or indirectly, teachers' capacity to change. Nor do we know whether and how teachers' characteristics, including their education and years of teaching experience, affect these constructs.

### **Hypotheses**

On the basis of our literature review, we predict that both distributed leadership and inquiry-based work exert direct, positive effects on teachers' capacity to change. As Park and Datnow (2009) indicate, we also anticipate that the positive effect of distributed leadership gets mediated by teachers' inquiry-based work, such that it can strengthen their capacity to change even more. Day et al. (2007) also offer insights on teacher development, leading us to expect that background characteristics directly affect leadership and inquiry-based work. Specifically, more years of experience and a master's degree should enhance teachers' inquiry-based work and cause them to be more likely to adopt distributed leadership roles. In Figure 1, we present our proposed model of the effects of distributed leadership and inquiry-based work on teachers' capacity to change and the expected effects of the background characteristics.



**Figure 1.** Model of the expected effects of distributed leadership and inquiry-based working on the capacity to change and the expected effects of teachers' background characteristics

### The Dutch education system

According to current Dutch educational policy, schools are autonomous in their pedagogical approaches, personnel, and financial management. Most primary schools are government-funded private organizations. In the Dutch system, education is intended for children between the ages of 4 and 12 years. No national curriculum is provided; school-level teams shape the educational and instructional quality to their students' needs, which influences the extent to which teachers work in routine or non-routine ways. However, quality standards (e.g., student results, teacher qualification requirements, number of teaching hours per year) apply to all schools, and schools are held accountable for student outcomes by the national inspectorate. The common quality standards, absence of a national curriculum, and requirements to serve the needs of different groups of students all highlight the strong demand for teachers with a good capacity to change.

## **Method**

### ***Sample and context***

Nearly 500 schools were invited to participate in this study. A total of 65 schools, located in the midwestern and eastern regions of the Netherlands, agreed to take part. The data we used to test our theoretical model (Figure 1) were generated from a questionnaire, distributed to 1,209 primary teachers working at these schools (their students are aged 4–12 years). Digital data collection took place from April–June 2016; 963 teachers returned the questionnaire, for a response rate of 79%. In screening these data, we removed teachers with item non-response patterns, leaving a final sample of 787 teachers working in 61 primary schools, of whom 89.4% were women and 10.6% were men. This gender imbalance reflects the Dutch primary school context; in primary schools in the Netherlands overall, approximately 13% of teachers are men ([www.statline.cbs.nl](http://www.statline.cbs.nl)). Furthermore, many of our study respondents were younger than 35 years (32%), and a majority of them had more than 10 years of experience (60%), while only 6% of the teachers in our sample had master's degrees.

### ***Variables***

To operationalize and measure the capacity to change, we used items pertaining to collaboration (i.e., joint work, task interdependency, and collegial support), professional learning activities (i.e., keeping up to date, experimenting, reflecting, and sharing knowledge and experience), and motivational aspects (i.e., internalization of school goals as personal goals, sense of self-efficacy, and job satisfaction). The distributed leadership items spanned four scales: (1) teachers adopting leadership roles based on knowledge, (2) teachers granting one another leadership roles, (3) teachers' participation in decision-making, and (4) active involvement in school development. Then for inquiry-based work, we included items that measured working with an inquiry habit of mind, demonstrating data literacy, using data in classrooms, and using data at the school level. To determine teachers' background characteristics, the study included questions about respondents' level of education, age, gender, and years of experience.

### ***Instruments***

The scales measuring the capacity to change and inquiry-based work were derived from existing questionnaires (Geijsel et al., 2001; Krüger, 2010a; Oude Groote Beverborg et al., 2015; Schildkamp et al., 2012). We formulated the scales to measure distributed leadership from research by Spillane and Healey (2010). To verify the validity of the items, we conducted pilot tests with 10 primary school teachers who were not otherwise connected to this research. All items used 5-point Likert scales, ranging from 1 (totally disagree) to 5 (totally agree). The background characteristics required distinct measures, as follows: Gender was binary (1 = female; 2 = male). For

age, respondents could choose from five categories (1 = younger than 25 years; 2 = 25–34 years; 3 = 35–44 years; 4 = 45–54 years, 5 = 55 years or older). Education level was measured by two dummy variables: bachelor's degree versus no bachelor's degree and master's degree versus no master's degree. And for years of experience, respondents could choose from four categories (1 = less than 4 years, 2 = 4–10 years, 3 = 10–15 years, and 4 = 15 years or more).

### Analysis

We performed a factor analysis in SPSS Version 23 to confirm that the survey items loaded on the pertinent factors. As illustrated in Table 1, the principal component analysis with Varimax rotation indicated that the items that we used to indicate certain factors grouped together. The reliability of the scales ranged from 0.72 to 0.92. These results support the viability of our proposed model.



**Table 1.** Survey instrument

| Scale   |  | Number of Items | Cronbach's Alpha |
|---|--|-----------------|------------------|
| Collaboration<br>(Cronbach's alpha = 0.78)                                | Joint work<br><i>Within our team, we discuss how we can improve instructional strategies.</i>  | 6               | .84              |
|   | Task interdependency<br><i>The work of one teacher influences the task performance of collegial teachers.</i>                        | 4               | .72              |
|   | Collegial support<br><i>My colleagues permit me to sit in on their lessons.</i>  | 6               | .85              |
| Undertaking professional learning activities<br>(Cronbach's alpha = 0.74) | Keeping up to date<br><i>I regularly search for new information about education.</i>   | 6               | .86              |
|   | Experimenting<br><i>I make my own instructional materials.</i>   | 4               | .74              |
|   | Reflecting<br><i>With a focus on the goals toward which I am working, I monitor my own development.</i>                              | 5               | .80              |
| Motivational variables<br>(Cronbach's alpha = 0.76)                       | Sharing knowledge and experience<br><i>Within our team, teachers share knowledge and experiences related to educational quality.</i> | 6               | .89              |
|   | Internalization of school goals into personal goals<br><i>Our school goals challenge me to develop myself.</i>                       | 4               | .80              |
|   | Self-efficacy<br><i>When I want to realize something in my work, I know I will manage it.</i>  | 5               | .81              |
|   | Job satisfaction<br><i>Working as a teacher is the most enjoyable job.</i>   | 5               | .88              |



| Scale   |  | Number of Items | Cronbach's Alpha |
|---|--|-----------------|------------------|
| Distributed leadership<br>(Cronbach's alpha = 0.86) | Teachers adopting leadership roles<br><i>In our school, teachers with specific qualities take a leading role.</i>  | 4               | .88              |
|   | Teachers granting one another leadership roles<br><i>In my school, based on specific expertise, my teacher colleagues may tell others in the school how all teachers can improve student outcomes.</i> | 6               | .92              |
|   | Teachers' participation in decision-making<br><i>In our school, we collectively make decisions according to new educational goals.</i>   | 3               | .72              |
|   | Teachers' active involvement in school development<br><i>In our school, teachers undertake initiatives of their own accord.</i>  | 4               | .77              |
| Inquiry-based working<br>(Cronbach's alpha = 0.79)  | Working with an inquiry habit of mind<br><i>In my work, I want an in-depth understanding of what I am doing.</i>   | 5               | .82              |
|   | Demonstrating data literacy<br><i>I am capable of interpreting data.</i>   | 6               | .79              |
|   | Using data at the school level<br><i>We improve our educational quality by comparing our student outcomes to those of other schools.</i>   | 6               | .89              |
|   | Using data in classrooms<br><i>In considering the special educational needs of my students, I use data on my students.</i>   | 4               | .81              |

Notes: The text in italics represents sample items for each scale.

To determine how distributed leadership and inquiry-based work affect teachers' capacity to change, as well as grasp the influence of teachers' background variables, we conducted a series of path analyses in LISREL 8.52 (Jöreskog & Sörbom, 1996). In an effort to clarify the effect sizes of the background variables, we converted the variables pertaining to leadership, inquiry-based work, and the capacity to change into z-scores. The scores of the background variables remained unchanged. We then conducted path analyses using a covariance matrix with all the relevant variables. Thus, we could address the validity of our theoretical model by comparing discrepancies between the covariance matrix of the observed data and the covariance matrix resulting from the theoretical model. The extent to which both matrices are compatible determines whether the theoretical model is feasible, considering the relations among the data. We used  $\chi^2$  values and the associated  $p$ -values, along with the root mean square error of approximation (RMSEA), adjusted goodness-of-fit index (AGFI), and comparative fit index (CFI) as model fit indices. The  $\chi^2$  value should be as low as possible, the RMSEA should be close to or lower than 0.05, and the AGFI and the CFI both should be greater

than 0.95 (Jöreskog and Sörbom, 1996). In assessing the significance of the path coefficients, we need to account for the fact that teachers in this study are clustered within schools. Ignoring the presence of clustering would lead to smaller estimated standard errors, which in turn could lead to false conclusions about the presence of significant path coefficients. We dealt with the presence of clustering by conducting the path analysis based on an adjusted sample size. The adjustment was based on the design-effect formula proposed by Snijders and Bosker (2012). We used the average school size (12.11) and the average intraclass coefficient (0.1) of the three dependent variables to compute the design effect and to decrease the sample size accordingly. As such, the effective sample size is 375.

In the first test of the model, we included all predicted causal relationships among distributed leadership, inquiry-based work, and the capacity to change. In this model, four variables—teachers adopting leadership roles based on knowledge, teachers granting one another leadership roles, teachers' participation in decision-making, and active involvement in school development—pertain to leadership from a distributed perspective. Four other variables—working with an inquiry habit of mind, demonstrating data literacy, using data in classrooms, and using data at the school level—refer to working in an inquiry-based way (Earl & Katz, 2006; Heck & Hallinger, 2009; Spillane, Hunt, & Healey, 2009; Uiterwijk-Luijk et al., 2017). The background characteristics—level of education, age, gender, and years of experience—serve as exogenous variables. This theoretical model demonstrates poor fit to the data ( $\chi^2(40, N_{effective} = 375) = 621.06, p = 0.00, RMSEA = 0.20, AGFI = 0.60, CFI = 0.77$ ), due to the high correlations among the separate scales in the study.

Therefore, in subsequent analyses, we adopted a path analysis approach based on the total reliability of each component (see Table 1). In the revised model, we aggregated the indicator scales into single variables representing distributed leadership, inquiry-based work, collaboration, professional learning activities, and motivational aspects. We also deleted nonsignificant paths from the model. Notably, the goodness of fit increased when we specified inquiry-based work as a mediator. Thus, with a model that incorporates inquiry-based work as a mediator between distributed leadership and the capacity to change, we attain good fit ( $\chi^2(16, N_{effective} = 375) = 7.39, p = 0.97, RMSEA = 0.00, AGFI = 0.99, CFI = 1.0$ ).

To verify the direction of the mediating variable, we compare this model against one that depicts an inverse predictive relationship, such that distributed leadership functions as a mediator variable. In this case, the fit of the model decreases ( $\chi^2(16, N_{effective} = 375) = 12.40, p = 0.72, RMSEA = 0.00, AGFI = 0.98, CFI = 1.0$ ). Therefore, the model featuring inquiry-based work as a mediating variable emerges as the best path model, in which the standardized residuals range from 0.03 to 1.11.

## Results

### *Descriptive data*

The midpoint of 5-point Likert scales is 3.0; the results indicate positive, relatively high scores for all the variables. The mean item scores for the four aspects of inquiry-based working vary between 4.17 and 4.59. For the four elements of leadership, the mean item scores range between 3.94 and 4.41, and for the capacity to change, they span 3.81 to 4.47. Among the background characteristics, the age range varies from 31.6% (younger than 35 years old) to 26.6% (36–45 years) to 41.8% (older than 45 years), generally in line with the national averages of teachers' age (i.e., 34.2%, 22.9%, and 42.5%, respectively). Whereas in our study, 6% of the teachers had a master's degree, the Dutch national average is 24% ([www.statline.cbs.nl](http://www.statline.cbs.nl)). Age and years of teaching experience correlate significantly ( $r = 0.73$ ). The correlations, means, and standard deviations of the latent variables and background characteristics are displayed in Table 2.

**Table 2.** Correlations, means, and standard deviations (Neffective = 375)

|  | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   |
|--|------|------|------|------|------|------|------|------|------|------|
| Inquiry-based work                           | 1    |      |      |      |      |      |      |      |      |      |
| Distributed leadership                       | .56  | 1    |      |      |      |      |      |      |      |      |
| Collaboration                                | .55  | .66  | 1    |      |      |      |      |      |      |      |
| Motivational aspects                         | .64  | .72  | .69  | 1    |      |      |      |      |      |      |
| Undertaking professional learning activities | .74  | .59  | .67  | .67  | 1    |      |      |      |      |      |
| Level of education, bachelor's degree        | .00  | -.02 | .01  | .01  | -.01 | 1    |      |      |      |      |
| Level of education, master's degree          | .02  | .01  | -.01 | -.00 | .01  | -.06 | 1    |      |      |      |
| Years of experience                          | .09  | .03  | .01  | .07  | .05  | .03  | .03  | 1    |      |      |
| Age  | .10  | .11  | .04  | .12  | .06  | -.00 | -.00 | .71  | 1    |      |
| Gender                                       | -.02 | .00  | -.02 | -.01 | -.03 | .01  | -.01 | .05  | .09  | 1    |
| M  | 4.36 | 4.16 | 4.03 | 4.33 | 4.15 | .90  | .06  | 3.09 | 3.28 | 1.10 |
| SD   | .44  | .61  | .56  | .51  | .49  | .30  | .24  | 1.04 | 1.20 | .30  |

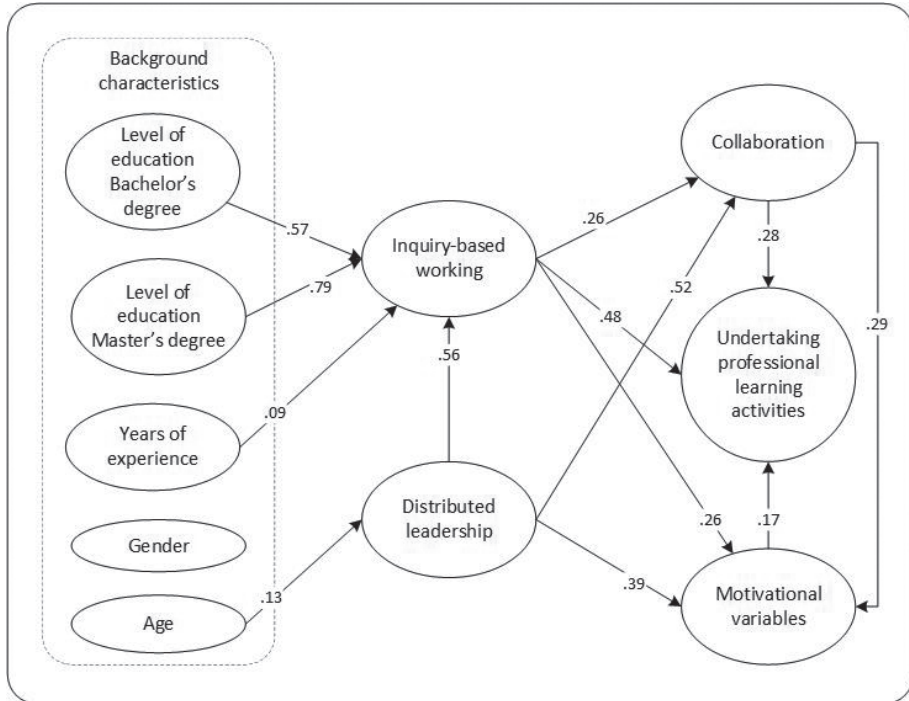
Notes: M = mean, SD = standard deviation.

In assessing the effect sizes, we computed the relative amount of variance explained (Cohen's  $f^2$  measure). The strength of the relationships among the model variables can be evaluated by comparing the path coefficients according to Cohen's  $f^2$

values: 0.02 = small (the variance explained is 2%), 0.15 = medium (the variance explained is 13%), and 0.35 = large effect; then, the variance explained is 26% (Wuensch, 2019). To interpret our data, we use a significance level of  $p < 0.05$ .

**Factors affecting teachers' capacity to change**

The path model results demonstrate that both distributed leadership and inquiry-based work affect collaboration, professional learning activities, and motivational aspects; their respective percentages of explained variance are 50%, 66%, and 65%. Figure 2 displays the final path model.



**Figure 2.** Final path model (with significant standardized effects,  $p < .05$ ).

Examining the path coefficients also enables us to address our hypotheses and interpret the effects of the exogenous variables. To facilitate this interpretation, we present the direct, indirect, and total effects of distributed leadership and inquiry-based work in Table 3. Then in Table 4, we provide the direct, indirect, and total effects of the background characteristics on inquiry-based work and distributed leadership; the effects of these characteristics on the endogenous variables in turn are listed in Table 5.

**Table 3.** Direct, indirect, and total effects of distributed leadership and inquiry-based work on collaboration, professional learning activities, and motivational aspects for all teachers (Neffective = 375)

|                        | Collaboration |          |       | Professional Learning Activities |          |       | Motivational Variables |          |       |
|------------------------|---------------|----------|-------|----------------------------------|----------|-------|------------------------|----------|-------|
|                        | Direct        | Indirect | Total | Direct                           | Indirect | Total | Direct                 | Indirect | Total |
| Distributed leadership | .52 *         | .15 *    | .67 * | -                                | .58 *    | .58 * | .39 *                  | .34 *    | .73 * |
| Inquiry-based work     | .26 *         | -        | .26 * | .48 *                            | .13 *    | .61 * | .26 *                  | .08 *    | .34 * |

\*Significant at  $T > 2$ .

**Table 4.** Direct, indirect, and total effects of background characteristics on distributed leadership and inquiry-based work (Neffective = 375)

|                                       | Distributed Leadership |          |       | Inquiry-Based Work |          |        |
|---------------------------------------|------------------------|----------|-------|--------------------|----------|--------|
|                                       | Direct                 | Indirect | Total | Direct             | Indirect | Total  |
| Level of education, bachelor's degree | -                      | -        | -     | .57 *              | -        | .57 *  |
| Level of education, master's degree   | -                      | -        | -     | .72 *              | .07 *    | .79 *  |
| Years of experience                   | -.08                   | -        | -.08  | .09 *              | -.05     | .04    |
| Age                                   | .13 *                  | -        | .13 * | .05                | -        | .05    |
| Gender                                | -                      | -        | -     | -.17               | -.05     | -.22 * |

\*Significant at  $T > 2$ .

**Table 5.** Direct, indirect, and total effects of background characteristics on collaboration, professional learning activities, and motivational aspects for all teachers (Neffective = 375)

|                                       | Collaboration |          |        | Professional Learning Activities |          |        | Motivational Variables |          |        |
|---------------------------------------|---------------|----------|--------|----------------------------------|----------|--------|------------------------|----------|--------|
|                                       | Direct        | Indirect | Total  | Direct                           | Indirect | Total  | Direct                 | Indirect | Total  |
| Level of education, bachelor's degree | -             | .15 *    | .15 *  | -                                | .35 *    | .35 *  | -                      | .20 *    | .20 *  |
| Level of education, master's degree   | -.37          | .21 *    | -.16   | -                                | .36 *    | .36 *  | -                      | .17 *    | .17 *  |
| Years of experience                   | -             | -.03     | -.03   | -                                | .01      | .01    | -                      | -        | -.03   |
| Age                                   | -             | .08 *    | .08 *  | -                                | .06      | .06    | -                      | .09 *    | .09 *  |
| Gender                                | -.24          | -.06 *   | -.30 * | -.21                             | -.21 *   | -.42 * | -                      | -.15 *   | -.15 * |

\*Significant at  $T > 2$ .

First, we anticipated a direct effect of distributed leadership on the capacity to change. The strongest direct effect of distributed leadership pertains to collaboration (34% of the variance in the collaboration variable scores was explained by distributed leadership) such that it directly and positively affects collaboration, as well as the motivational aspects (28% of the variance in the motivational variable scores was explained by distributed leadership). When distributed leadership increases, teachers' collaborative efforts, sense of self-efficacy, and job satisfaction all expand, as does their tendency to internalize school goals as personal aims. An indirect effect of this leadership perspective, through motivational aspects, also influences teachers' professional learning activities.

Second, we predicted that inquiry-based work would have a direct positive effect on teachers' capacity to change. The paths in the final model suggest that such work methods directly and positively affect collaboration (14% of the variance in the collaboration variable scores was explained by inquiry-based working), the extent to which teachers engage in professional learning activities (35% of the variance in the undertaking of professional learning activities variable scores was explained by inquiry-based working), and the motivational aspects (17% of the variance in the motivational variable scores was explained by inquiry-based working), with moderate to large effects. That is, teachers are more likely to collaborate and participate in professional learning activities when they have a strong commitment to inquiry-based work. This factor likewise enhances their sense of self-efficacy, job satisfaction, and tendency to internalize school goals as personal aims. These direct effects are large.

Third, our theory held that the positive effect of distributed leadership on the capacity to change would be mediated by teachers working in an inquiry-based way. This mediation appears in the path from distributed leadership to inquiry-based work, which suggests that inquiry-based work strongly and positively mediates distributed leadership's effect on the three elements of teachers' capacity to change. Specifically, teachers' collaboration, initiatives to undertake professional learning activities, and motivational aspects are powerfully reinforced when, on the basis of experience, they adopt leadership roles and grant those roles to colleagues, in the presence of inquiry-based work methods.

Fourth, among the background characteristics—educational level (bachelor's or master's degree), years of teaching experience, age, and gender—only gender reveals an influence on teachers' capacity to change, and that significant effect is indirect. Following Mistry and Sood (2016), we interpret this finding cautiously though. Both bachelor's and master's degrees directly and positively enhance teachers' inquiry-based work, and the effect of the master's degree is larger. However, only 5% of the variance in the inquiry-based working scores was explained by the master's degree variable. Teachers' level of education does not affect their distributed leadership. Furthermore, age has a small-sized, direct, positive effect on distributed leadership: With increasing age, teachers appear to be more inclined to adopt this leadership perspective. Yet, age does not significantly affect inquiry-based work. We also find unexpected, indirect, small effects of age on two elements of teachers' capacity to change: collaboration and motivational aspects. The older a teacher is, the more likely they appear to be to engage in collaboration and the higher their sense of self-efficacy, job satisfaction, and propensity to internalize school goals as personal objectives.

## **Conclusions and discussion**

The study yields three main results: Inquiry-based work mediates the positive effect of distributed leadership on teachers' capacity to change. Both this leadership approach and inquiry-based work affect teachers' capacity to change directly. In particular, collaboration, the extent to which teachers undertake professional learning activities, and several motivational aspects are critical. Teachers' education levels directly and positively influence their inquiry-based work, and the impact of having a master's degree is even greater than the effect of having a bachelor's degree. As teachers age, they also adopt the distributed leadership perspective more.

Therefore, the more a school leader commits to hiring teachers with expertise and affinities and involving them in school policies, the stronger those teachers' ability to initiate and respond to educational changes. If teachers perceive their school as an organization in which leadership is more distributed, the extent of collaboration

reinforces these effects. Teachers' sense of self-efficacy increases, they may be more satisfied in their job, and they tend to internalize school goals. In this sense, our current study extends work by Buske (2018), Greany (2018), and Hulpia et al. (2009) that suggests distributed leadership relates positively to teachers' collaboration, commitment, and sense of self-efficacy.

The ability to initiate and respond to educational changes increases even more when teachers work, individually and collectively, in an inquiry-based way. When they adopt an inquiry habit of mind and use available data in the school and classroom, thereby transforming the data into information and knowledge (Earl & Katz, 2006), teachers also tend to collaborate and participate in professional learning activities. In turn, their sense of self-efficacy, job satisfaction, and likelihood of internalizing school objectives get reinforced. These effects expand on research by Uiterwijk-Luijk et al. (2017), who identify a positive correlation between inquiry-based work and self-efficacy, and by Bangs and Frost (2016), who find that an effective learning environment marked by constant change encourages joint work based on data and evidence. Teachers and school leaders can learn collectively and increase educational and instructional quality, focused on serving the needs of different groups of students. We did not perform an in-depth analysis of how participating teachers perceive the distribution of leadership roles or the extent to which their colleagues work in an inquiry-based way, yet our finding that inquiry-based work functions as a mediator between leadership and teachers' capacity to change extends research by Park and Datnow (2009) that cites a relationship between collective decision-making and data use. In our study, inquiry-based work exceeds data use, and distributed leadership exceeds collective decision-making. Although the best fitting model includes inquiry-based work as the mediator variable (not distributed leadership), we might question whether it depicts the only possible direction. In support of this directionality, working in an inquiry-based way affirms the need for innovation, in that data support teachers' choices to pursue innovations and enhance their leadership performance. As such, inquiry-based work should expand teachers' expertise, and this expertise is a key determinant of the success of distributed leadership (Spillane & Healey, 2010). Expertise based on facts also may enhance teachers' willingness and preparedness to share their knowledge and possibly stimulate them to adopt leadership roles.

Finally, we expected their background characteristics to affect teachers' perceptions of leadership and inquiry-based work directly. We find a small difference between bachelors' and masters' degrees, when it comes to teachers' inquiry-based work, but teachers with either type of degree appear able to transfer new ideas into action, by leveraging their inquiry habit of mind and data use. Therefore, educational authorities should encourage schools to hire employees who have at least a bachelor's degree. Here, our findings contrast with Frost's (2012), though

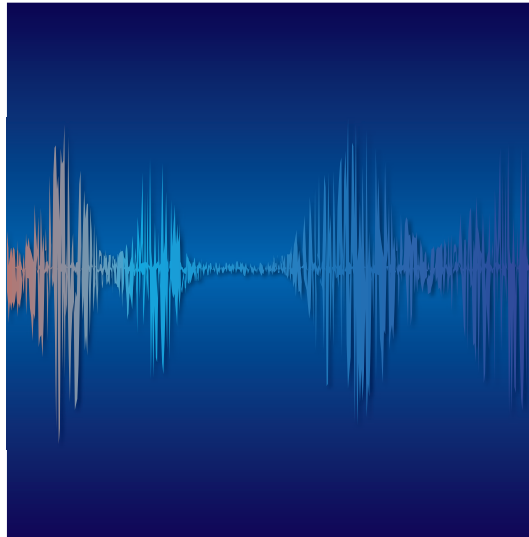


we also acknowledge that our findings derive from a limited group (i.e., only 6% of our sample had advanced degrees). Furthermore, Frost argues that teachers who realize the importance of inquiry-based work because of their efforts to obtain their master's degree might be better able to contribute to educational development at the school level. However, the Dutch vocational education system trains teachers in the inquiry-based work approach, which might offer a plausible explanation for our findings. In addition, we do not find that teachers' education has any significant impact on their perceptions of leadership. Perhaps expertise with distributed leadership links more closely to specific topics, rather than implying a higher level of expertise in general. If so, distributed leadership roles could be independent of teachers' educational level. Furthermore, our results imply that with increasing age, teachers perceive their school as an organization in which leadership is more distributed. We do not find significant effects for years of teaching experience, though we note a strong linear relationship between years of teaching experience and age. Therefore, we turn to Day et al. (2007), who point out that the school leader should pay attention to teachers' welfare and need to be challenged, especially as their years of teaching increase, to reinforce their commitment to learning and change and to prevent boredom.

In the current study, all variables are measured with the same instrument as the teachers all completed the same questionnaire. Although the main effects we found are in line with our expectations with respect to dependency, our results do not provide information about the exact way in which these dependencies were developed. This means caution is advised with regard to potential causal claims. Longitudinal research is needed to further investigate how certain factors specifically contribute to the relationships between the variables. Also, the conventions with respect to the effect sizes we used should be carried out with caution, since a large effect in one context may be a small effect in another context (Wuensch, 2019). Furthermore, due to the design effect, the effective sample size is significantly lower than the number of participants. Follow-up research with a larger number of schools and teachers, allowing for multilevel structural equation modeling, could contribute further to the testing of more complex models and our understanding of the relationships between inquiry-based working, distributed leadership, teachers' collaboration, their professional learning activities and the motivational variables. Also, as in our study, the participants scored relatively high on all variables, such follow-up research may distinct differences between high and low performing schools in the process of building teachers' capacity to change by working in an environment of inquiry-based working and distributed leadership.

### **Implications**

This study offers new insights into the impact of distributed leadership and inquiry-based work on teachers' capacity to change. Overall, our findings suggest that when they focus on serving the needs of different groups of students, schools can realize change successfully if (1) school leaders allow teachers to adopt leadership roles based on their expertise and from a distributed perspective, (2) teachers commit to taking on such roles, and (3) teachers work collectively on assumed problems or issues in an inquiry-based way. School leaders and teachers thus must create a safe, supportive school culture that shares and distributes leadership roles. In such settings, teachers' sense that they can achieve their goals should increase, and they may become more interested in professionalization and joint work efforts. With a distributed leadership infrastructure, school leaders also should encourage and support teams to perform inquiry-based work and grant them space to collaborate in analyzing their circumstances and determining their priorities accordingly (Buske, 2018; Van Gasse et al., 2017; Van Geel et al., 2017). Compatibility across all of these factors may enhance teachers' capacity to change even further.



# 4

## CHAPTER

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### RELATIONSHIPS IN DISTRIBUTED LEADERSHIP, INQUIRY-BASED WORKING AND REALIZING EDUCATIONAL CHANGE IN DUTCH PRIMARY EDUCATION: TEACHERS' AND THEIR SCHOOL LEADER'S PERCEPTIONS

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This chapter is based on: Amels, J., Krüger, M. L., & Van Veen, K. (2020). Relationships in distributed leadership, inquiry-based working, and realizing educational change in Dutch primary education: Teachers' and their school leader's perceptions. *International Journal of Leadership in Education*,  
DOI: 10.1080/13603124.2020.1842505

**Abstract**

*Although distributed leadership and inquiry-based working are relevant topics to primary education, there has been little discussion about how team members perceive these practices as meaningful in their day-to-day work. Following on from prior quantitative studies, the present study conducted a case study in which semi-structured interviews were employed to collect data. The findings suggested that teachers and their principal perceive distributed leadership and inquiry-based working as crucial to realizing educational change. More specifically, the case study showed how inquiry-based working could support distributed leadership and teachers' ability to take the initiative to create educational change. Specifying the relationships could help teachers and school leaders to consciously leverage distributed leadership and inquiry-based working techniques to fully meet students' needs.*

## Introduction

The use of data in primary education is considered increasingly important for gaining a better understanding of pupils' learning processes and improving the quality of teaching (e.g., Brown, Schildkamp, & Hubers, 2017; Datnow & Hubbard, 2016; Deppeler & Ainscow, 2016; Schildkamp, 2019). However, data alone do not provide all the information required by teachers and neither does access to large amounts of data guarantee educational improvement. Data must be analyzed and interpreted to find the answers to critical questions on student outcomes and education quality. Such analysis and interpretation require inquiry-based working and an involvement in deep learning (e.g., Earl & Katz, 2006; Uiterwijk-Luijk, Krüger, Zijlstra, & Volman, 2017; Krüger, 2010). Inquiry-based working, as used by Earl & Katz (2006), Krüger (2010); Uiterwijk-Luijk et al. (2017), and Mandinach & Schildkamp (2020), is related to data-driven decision making (DDDM) in the sense that data are used as a basis of making decisions. However, inquiry-based working is much more complex. It demands an inquiry habit of mind and conducting inquiry in the school by teachers as well as school leaders and administrators. Moreover, it demands the competency of leaders to give lead to the development of an inquiry-based culture. An inquiry habit of mind involves heightened curiosity and asking questions to improve teaching strategies and realize educational development at the classroom and school level. The term "inquiry-based working" is used throughout this paper based on the definition outlined above (Earl & Katz, 2006; Krüger, 2010; Mandinach & Schildkamp, 2020; Uiterwijk-Luijk, Krüger, & Volman, 2019; Uiterwijk-Luijk et al., 2017).

The term culture in the context of the development of an inquiry-based culture can be defined in terms of organizational culture, in which we follow Schein (1992, p. 9)'s definition: "A pattern of shared basic assumptions invented, discovered, or developed by a given group as it learns to cope with its problems of external adaptation and internal integration that have worked well enough to be considered valid and therefore, to be taught to new members as the correct way to perceive, think and feel in relation to those problems". In other words, an organizational culture focused on the development of an inquiry-based way of working implies that this way of working becomes part of the customs of that given group of people.

Realizing change requires coordination and leadership and is more successfully achieved when school leaders involve teachers in leadership activities to ensure their commitment to educational change (e.g., Brown et al., 2017; De Matthews, 2014; Klar, Huggins, Hammonds, & Buskey, 2016; Van Geel, Keuning, Visscher, & Fox, 2018). Previous studies (Aldaihani, 2019; Geijssels, Slegers, Stoel, & Krüger, 2009; Heck & Hallinger, 2009; Buske, 2018; DeMatthews, 2014; Johnson & Voelkel, 2019; Klar et al., 2016) have shown that teachers' involvement in their schools and in educational development may lead to successful educational change and that

inquiry-based working can mediate the positive effect of leadership distribution on teachers' change capacity. However, these quantitative studies do not provide in-depth insights into how teachers themselves perceive inquiry-based working in their day-to-day practices and how this way of working helps them realize educational change. Furthermore, distributed leadership has also been found to be positively related to inquiry-based working, though in what specific way it is related remains unclear. Therefore, the present study aims to address this gap in the research by exploring a best practice example selected from previous studies. This best practice is a case study of a school in which both the teachers and school leader had positive attitudes toward inquiry-based working and in which teachers were strongly involved in leadership activities. The main research question examined in this study is how teachers and their school leader perceive the relationship between inquiry-based working, distributed leadership, and realizing educational change in their daily practices.

### **Theoretical background**

This section first defines the key constructs of this study: teachers' capacity to change, inquiry-based working, and distributed leadership. Following this, the relationships between the constructs are described.

#### ***Teachers' capacity to change***

Teachers' capacity to realize educational change is generally defined as their ability to adopt innovations initiated by governments, school boards, or themselves, as well as their potential to connect educational development and improvements to both individual and collective learning processes that engender change (Geijsel, Van den Berg, & Slegers, 1999; Harris, Adams, Jones, & Muniandy, 2015). An individual's capacity for change is critical in constantly changing and developing societies (Greany, 2018). This capacity represents a competence rather than a disposition; it is a dynamic element that can be developed and strengthened over time by activities and efforts initiated by school leaders or teachers. In the present study, educational change refers to changes in teaching practices that aim to improve students' learning. Meanwhile, teachers' capacity to change is defined as their ability to adopt changes in their teaching practice with the aim of improving students' learning. Based on the work of Geijsel et al. (2009), Geijsel et al., (1999), Ho and Lee (2016), and Stoll (2009, 2013), teachers' capacity to change is operationalized and investigated in terms of three contributing aspects: (1) collaboration (the interpersonal aspect); (2) teachers' undertaking of professional learning activities (the organizational aspect); and (3) motivational variables, such as the extent to which teachers internalize school goals and turn them into personal aims, their sense of self-efficacy, and their job satisfaction (the personal aspect).

### ***Collaboration***

Educational change regarding teaching practices aimed at improving student learning is more successful when teachers collaborate with their colleagues (Ho & Lee, 2016; Stoll, 2009, 2013). As described by Little (1982), such collaboration refers to teachers working jointly to reach goals or solve problems by exchanging experiences, ideas, and knowledge.

### ***Undertaking professional learning activities***

Undertaking professional learning activities is the organizational aspect of teachers' capacity to change. A teacher's level of active learning is determined by the extent to which they keep up to date with educational developments (Borman, Hewes, Overman, & Brown, 2003; Geijssel et al., 2009). Teachers who engage in such learning activities tend to share their knowledge and experience more; in addition, they tend to experiment with and reflect on their own work and classroom teaching (Hargreaves & Fullan, 2012; Thoonen, Slegers, Oort, & Peetsma, 2012).

### ***Motivational variables***

Thoonen, Slegers, Oort, Peetsma, and Geijssel (2011) found that teachers' commitment, professional efficacy, and job satisfaction were supportive motivational variables in educational change. Job satisfaction reflects a teacher's emotional state, which is informed by their experiences at work (Hulpia, Devos, & Rosseel, 2009). Job satisfaction is influenced by both teachers' dispositional characteristics and the situational factors of the job. Teachers who are satisfied with their jobs have been shown to be more dedicated to their schools and more likely to contribute to and accept change (Thoonen et al., 2011).

Professional efficacy refers to a teacher's own beliefs about the professional competences they are expected to display in any given situation (Geijssel et al., 2009). Teachers with a strong sense of professional efficacy are more open to new ideas and more willing to experiment with new teaching methods (Lauermann & Karabenick, 2013). A strong sense of professional efficacy can, therefore, contribute positively to teachers' ability to realize educational change (Woolfolk, Hughes, & Walkup, 2008). Furthermore, organizational commitment or the extent to which a teacher feels psychologically allied to their place of work (Moin, 2018) is strongly related to employees' behavior and intentions and, as such, can impact the realization of educational change (Delegach, Kark, Katz-Navon, & Van Dijk, 2017). Teachers who are committed to their schools have a strong belief in and acceptance of their school's goals, values, and vision as they relate to educational change (Geijssel et al., 2009; Moin, 2018).



***Inquiry-based working***

In recent years, more and more scientific literature on inquiry-based working has been published internationally (see, for example, Mandinach & Schildkamp, 2020; Marsh & Farrell, 2015; Uiterwijk-Luijk et al. 2019; Uiterwijk-Luijk et al., 2017). Inquiry-based working is important for several reasons. First of all, due to the change from an industrial to a knowledge society, it is important that students develop into inquiring citizens. Second, schools are innovative organizations, creating a need for data, both to support innovation and to monitor the innovation. Finally, schools are held more and more responsible for the quality of education, for the effectiveness of the school (external accountability). Therefore, it is necessary to collect data in the school. In summary, research in schools can be used for school development, for educational development and for accountability. Learning takes place at all levels in the school, not only by students, but also by teachers, school leaders and administrators. Previously, the term data driven decision making was more commonly used. (Ikemoto & Marsh, 2007; Lai & Schildkamp, 2013; Van Geel et al., 2016). However, where in case of inquiry-based working the emphasis is on the development perspective, data driven decision making emphasizes the accountability perspective with the criticism that it leads to a culture of accountability in schools that is counterproductive to learning. Inquiry-based working implies that teachers, school leaders and administrators themselves also work from an inquiry habit of mind, that they possess research skills to understand, analyze and interpret data and that they collaborate with colleagues in a culture of inquiry. This also demands something from their role as a leader: they must be able to lead an inquiry-based culture in their schools. Inquiry-based leadership is the stimulation of the joint use of data for educational and school development (Krüger, 2010). It requires the competence to organize the professional dialogue with the aim of jointly giving meaning to data. In this way people in the school again and again go through the process from data to information to knowledge to wisdom (Ikemoto & Marsh, 2007).

In the present study inquiry-based working is defined as having an inquiry habit of mind, as being data literate, and as contributing to a general culture of inquiry (Earl & Katz, 2006; Uiterwijk-Luijk et al., 2017). Inquiry-based working concentrates on enhancing curiosity, asking questions, and being open to deep learning as a means of improving teaching strategies and realizing educational change (Earl & Katz, 2006; Krüger, 2010; Mandinach & Schildkamp, 2020; Uiterwijk-Luijk et al. 2019; Uiterwijk-Luijk et al., 2017). Of all aspects of inquiry-based working, working with an inquiry habit of mind appears to be the most important driver in enhancing teachers' capacity to change (Author, 2019). In inquiry-based working, teachers and others systematically collect and analyze all the available data at the school and the classroom level (Earl & Fullan, 2003; Marsh & Farrell, 2015 Uiterwijk-Luijk et al., 2017). Data may be quantitative (e.g., test results) or qualitative (e.g., interviews,

observation reports) and may be acquired from schools or by external research. Data can also take different forms, including input (e.g., children's school entry), process (e.g., observations of school improvements), satisfaction (e.g., stakeholder surveys), or output (e.g., student outcomes) data (Marsh & Farrell, 2015). Teachers who obtain meaningful information and learn from such data are said to be data literate (Mandinach & Gummer, 2013). Using data in the classroom can help teachers effectively anticipate students' needs as they investigate and reflect on their own practices. By using data at the school level, teachers collectively give meaning to the data and, by conducting collaborative analyses and interpretations of the data, can draw insight into how certain teaching practices may be reinforced. In this collaborative process, wherein deep learning takes place, new ideas and knowledge can emerge that subsequently encourage instructional improvement (Katz & Dack, 2014; Little, 2012). Therefore, organizational cultures that foster working with an inquiry habit of mind, using data, and being data literate can encourage greater educational improvement (Brown et al., 2017; Deppeler & Ainscow, 2016; Krüger & Geijsel, 2011; Schildkamp, 2019; Schildkamp, Ehren, & Lai, 2012; Uiterwijk-Luijk et al., 2017).

### ***Distributed leadership***

Developing and maintaining inquiry-based work practices requires coordination; therefore, leadership is crucial (Spillane, 2012b). School leaders can organize, support, and enable inquiry-based working by being cognizant of teachers' needs for involvement in change processes. In such scenarios, leadership is a feature of an organization, rather than of a single person (Spillane, 2012a, 2012b). For this reason, this study focuses on distributed leadership. In distributed leadership, leadership is assumed to be a feature of a team as a whole (Spillane, 2012a; Harris, 2014). Distributed leadership exists as a continuum and varies in extent (Tam, 2019; Tian, Risku, & Collin, 2016) as the best-equipped or skilled team members with respect to particular goals or organizational necessities take on leadership roles (Binkhorst et al., 2018; Harris, 2014; Spillane, 2012a). A well-supported distribution of leadership can enhance an organization's capacity to learn and change. The success of such changes also depends on the degree of teachers' involvement in an organization and in decision-making processes (e.g., Aldaihani, 2019; Heck & Hallinger, 2009; Buske, 2018; DeMatthews, 2014; Johnson & Voelkel, 2019; Klar et al., 2016). Distributed leadership includes both formal leadership roles adjudged by the school leader and informal leadership roles informally adjudged and taken by colleagues, together with initiators and followers, where initiators are teachers who take on leadership roles based on their expertise, and followers are teachers who follow their initiating colleagues in light of their knowledge on a specific topic (Spillane, 2012a). Leadership distribution ensures that teachers' expertise is employed, responsibility is shared, and decisions are made collectively.

The extent to which leadership roles are distributed also depends on the school leader's beliefs about what needs to be achieved, the expertise present among the teachers, and the principal's own capabilities (Pineda-Báez, Bauman, & Andrews, 2019; Spillane, Camburn, & Pareja, 2007; Szeto & Cheng, 2018). For example, a principal may share decision-making by embracing interactions, stimulating collaborative work settings, and creating conditions for others to lead with clear direction (Harris, 2014; Heck & Hallinger, 2009). In light of the above discussion, in the present study, distributed leadership is explored with reference to teachers who take on leadership roles through initiating and taking responsibility, teachers who grant one another leadership roles, teachers who participate in decision-making regarding educational development at the school level, and teachers who actively involve themselves in school development (Aldaihani, 2019; Heck & Hallinger, 2009; Spillane 2012a).

***Connection to previous studies: Relationships between inquiry-based working, leadership, and educational change***

Organizational cultures in which inquiry-based working and data use are common can foster educational improvement (e.g., Krüger & Geijsel, 2011; Schildkamp et al., 2012). Reform and change are supported by inquiry-based working (Earl & Katz, 2006; Krüger, 2010; Uiterwijk-Luijk et al., 2019; Uiterwijk-Luijk et al., 2017) because this method of working leads to deeper learning across a school (Van Gasse, Vanlommel, Vanhoof, & Van Petegem, 2017; Katz & Dack, 2014).

Developing and maintaining an inquiry-based work environment requires coordination and facilitation. Cranston (2016) and Spillane (2012b) found that leadership that specifically prompts teachers to recognize their ownership of change initiatives may be crucial to the development of such a working environment. According to Schein (1992), leadership and organizational culture are strongly related: the leader shapes the culture and is in turn shaped by the resulting culture. Schein even stated that "the only thing of real importance that leaders do is to create and manage culture and that the unique talent of leaders is their ability to work with culture" (Schein, 1992, p. 5). Schein has been criticized for being too mechanistic and overstating the impact of leaders on organizational culture (Morgan, 1997). However, in organizing a culture focused on teacher learning and educational change in schools, school leaders are found to be crucial in such a process (Sleegers & Leithwood, 2010). Research on the role of leadership in primary education to encourage teachers to adopt inquiry-based working practices is still scarce (Cranston, 2016; Uiterwijk-Luijk et al., 2017). Previous studies (Aldaihani, 2019; Geijsel et al., 2009; Heck & Hallinger, 2009; Buske, 2018; DeMatthews, 2014; Johnson & Voelkel, 2019; Klar et al., 2016) have shown that teachers' involvement in their schools and in educational development may lead to successful educational change and that inquiry-based working can mediate the positive effect of leadership

distribution on teachers' change capacity. However, an in-depth understanding of teachers' perceptions of inquiry-based working in their day-to-day practices and the relationships between the constructs, as well as how this method of working helps realize educational change, is as yet unclear.

Accordingly, this study addresses the following research question: *How do teachers and their school leader perceive inquiry-based working and distributed leadership as being related to realizing educational change?*

### **Research Context**

This study focuses on primary education in the Netherlands for children aged 4–12 years spread out over eight different grades. Schools in the Dutch education system are largely autonomous in their educational, pedagogical, and financial practices (Organization for Economic Co-operation and Development [OECD], 2012). There is no national curriculum, though the Dutch government issues evaluation and assessment mandates, such as risk-based inspections. Control over test results is central, and the use of assessment data to improve student outcomes has increased. Quality standards focus on cognitive subjects and are applied to all schools. These standards include specific targets set by the government for all grades. In the final year of primary education, a national test is completed by all students, and students receive a recommendation for an appropriate secondary school based on their test results. In addition, schools are monitored by the National Inspectorate, which is the institute responsible for maintaining educational quality and holding schools accountable. To comply with quality standards and serve the different educational needs of students, schools are expected to strive for improvements in teaching. Inquiry-based working is assumed to be helpful in adapting improved teaching strategies (Datnow & Hubbard, 2016), as is involving teachers in leadership (e.g., Buske, 2018).

## Methodology

### *Design and case selection*

To explore how inquiry-based working and distributed leadership as they relate to educational change are perceived, a research design close to teachers' day-to-day practices was formulated. Therefore, a qualitative case study methodology was employed, which involved conducting interviews (Deppeler & Ainscow, 2016; Yin, 2018). The unit of analysis was a Dutch primary school. The case study school was selected from a sample of 65 primary schools that participated in a previous study conducted in April 2016, in which almost 500 schools were invited by post and e-mail to participate (Author, 2020). This previous study explored the extent to which inquiry-based working and distributed leadership affect teachers' capacity to change. A web-based survey was sent to 1,209 teachers, which resulted in a sample of 787 teachers after cleaning the data. In addition, the principals of all the participating schools were interviewed.

In the present study, the case study school was selected based on its teachers' high scores and the strong correlations among the focal constructs of inquiry-based working and distributed leadership noted in the previous survey study. Therein, a 5-point Likert scale was used, ranging from 1 to 5. The average scores of the case study school were  $M = 4.5$  on inquiry-based working (Mall schools = 4.1),  $M = 4.4$  on distributed leadership (Mall schools = 4.0), and  $M = 4.4$  on capacity to change (Mall schools = 4.1). Overall, with regard to the selected case study, the standard deviations were small, varying between 0.21 and 0.57. Teachers' answers were very similar. The correlations between the constructs ranged from 0.56 to 0.74 (Author, 2020). Although other schools also scored high on the questionnaire, compared with the other schools the answers given by the principal of the selected school were strongly in line with the teachers' questionnaire results. For example, the principal explained

*I want to make use of all the available expertise. With regard to specific topics, some teachers have more expertise than I have myself. I encourage my teachers to come to the fore and share their knowledge. And my teachers give room to one another to do so and take the initiative. I also encourage them to enquire things instead of accepting unquestioningly. Thereby, we use data because data are supportive. But moreover, they are essential as they show us what to do.*

By combining the teachers' questionnaire results and the principal's interview responses, the best practice school emerged. The strong presence of inquiry-based working and distributed leadership made it possible to investigate which teachers' and principal's perceptions and experiences may rise with regard to the relationships between inquiry-based working, participating in leadership activities

and realizing educational change. Further, selecting a high-scoring school for the current study was essential for exploring the research question as it was necessary to ensure that the aim of identifying the relationships between the main constructs (i.e., inquiry-based working, distributed leadership, and realizing educational change) would not be disturbed due to a lack of distributed leadership or inquiry-based working.

As teachers' capacity to change does not appear to be a commonly discussed concept in teachers' practices, teachers may not be aware of their capacity to change. However, teachers may be aware of their needs, preparedness, and willingness to realize educational change (Deppeler & Ainscow, 2016; Harris et al., 2015). Accordingly, in the present study, when interviewing teachers, the term "realizing educational change" was used, rather than referring to teachers' "capacity to change."

### ***Description of the school***

The focal school was located in a small city in the eastern part of the Netherlands. In this district, 26% of the inhabitants were migrant, in general coming from Asian countries such as Syria and Afghanistan ([www.cbs.nl](http://www.cbs.nl)). In the school's student population, this percentage was reflected. The culturally diverse student population and the variation in socioeconomic status within the students' population demanded for the school's specific attention in meeting the educational needs of all their students.

The team comprised 23 Dutch, white teachers (2 male, 21 female), a principal, and a location manager who were both female. Teachers' age varied between 21 and 63 years. All teachers were employed on fixed-term-contracts.

The school was governed by a school board. Most teachers worked in one grade; a few teachers spanned two grades but still taught the same student age-group. Beyond their teaching, several teachers undertook other formal tasks, such as serving special educational students' needs and providing digital support. The school had an explicit shared educational policy with a strong focus on students' well-being and learning and on pedagogical and professional relationships; in addition, it emphasized "responsibility and autonomy" and characterized educational change as "an ongoing process."

### ***Participants***

The teachers were asked to participate voluntarily. Twelve of the 23 teachers expressing a willingness to participate. All grades were included. The principal played a crucial role in encouraging teachers to adopt inquiry-based work practices

(Spillane, 2012b), and the extent to which leadership roles were distributed also depended on the principal's beliefs about the teachers' different levels of expertise (Pineda-Báez et al., 2019; Spillane, Camburn, & Pareja, 2007; Szeto & Cheng, 2018); therefore, the principal was also interviewed. As such, a complete picture was obtained. All participants were native Dutch. One of the participating teachers was male, the other teachers as well as the principal were female. Their years of teaching experience at this school varies between 2 and 18 years. Table 1 provides a descriptive overview of the participants, who are identified with pseudonyms. The 13 participants were interviewed in November 2017.

**Table 1.** Descriptive overview of the participants

| Team member | Function                          | Gender** | Years of Teaching Experience | Years of Teaching Experience at the School | Level of Education* |
|-------------|-----------------------------------|----------|------------------------------|--|---------------------|
| 1 Anna      | Teacher grade 1/2                 | female   | 2                            | 2  | M                   |
| 2 Ella      | Teacher grade 1/2                 | female   | 8                            | 7  | B                   |
| 3 Karen     | Teacher grade 3                   | female   | 10                           | 10   | M                   |
| 4 Jenna     | Teacher grade 4                   | female   | 9                            | 9  | B                   |
| 5 Kim       | Teacher grade 5                   | female   | 5                            | 2  | B                   |
| 6 Lynn      | Teacher grade 5/6                 | female   | 8                            | 2  | B                   |
| 7 Kate      | Teacher grade 6                   | female   | 9                            | 8  | B                   |
| 8 Laura     | Teacher grade 7, location manager | female   | 15                           | 15   | B                   |
| 9 Lucas     | Teacher grade 7                   | male     | 17                           | 3  | B                   |
| 10 Fay      | Teacher grade 8                   | female   | 4                            | 4  | B                   |
| 11 Eva      | Teacher grade 8                   | female   | 9                            | 9  | B                   |
| 12 Emily    | School leader                     | female   | 37                           | 18   | M                   |

\*B = Bachelor's degree, M = Master's degree.

\*\* A relatively common gender distribution in Dutch primary schools

### ***Interviews and procedure***

The interview protocol was based on the scales measured in the teachers' questionnaire (inquiry-based working, distributed leadership, teachers' capacity to change, and the questionnaire results [Author, 2020]). Questions on the participants' perceptions of these concepts were included, and the questionnaire also explored the relationships between distributed leadership, inquiry-based working, and realizing educational change. Additional questions were asked to determine whether the respondents' interpretations of distributed leadership and inquiry-based working were in line with the definitions used in the present study. The same questions were presented to the teachers and the principal, though an additional question was added to assess the principal's role in encouraging teachers to realize change (see appendix B1 and B2 for the interview protocols).

All interviews were conducted by a single researcher and lasted approximately one hour. With regard to ethical considerations, the purpose of the research was presented to the participants. Consent to take part in the study was obtained from the participants, and they were also asked for their consent for the findings of the research to be published. Assurances were provided that no personally identifiable details would be included, and the participants were informed that they could withdraw from the study at any time. All participants granted permission.

### **Data Analysis**

The interviews were digitally recorded, transcribed verbatim, and coded by two researchers using ATLAS-ti version 1.6.0. Deductive coding was first adopted using codes such as working with an inquiry habit of mind, data use at the classroom and school level, the adoption of leadership roles by teachers, the granting of leadership roles by teachers, and the active involvement of teachers in school development. Additional codes, such as the relationship between inquiry-based working and realizing change, distributed leadership, and realizing change, as well as between all three constructs, were also formulated. Two researchers extracted key sentences from the interview transcripts that represented the codes (Cohen's kappa = .77, which was substantial; 90% agreement). Differences in coding were identified, discussed, and resolved by the two researchers. In the discussion, an inductive approach allowed other codes to emerge from the data, such as trust, which was described the feeling that a colleague was considerate, thoughtful, fair, and transparent (cf. Fink, 2016), and transparency, which was described as openness at the team level with regard to how leadership roles are formally and informally adjudged (cf. Spillane & Healey, 2010).



## Results

Prior to answering the research question, the alignment of the participants' perceptions of the constructs with the definitions utilized in the present study was confirmed. The teachers described inquiry-based working as being focused on supporting one another's efforts to meet students' day-to-day educational needs using data. These data included test results, teachers' observations, conversations with students and parents, and satisfaction ratings (Marsh & Farrell, 2015; Uiterwijk-Luijk et al., 2017). All 11 teachers referred to meetings in which they collaboratively analyzed and interpreted data, searched for strong and weak points in their teaching strategies, asked questions of one another, and evaluated actions. According to Anna [2]<sup>1</sup>, Jenna [9], Lynn [9], Kate [9], Karen [10], and Laura [15], they were eager to learn. They considered themselves curious, continuously questioning, and focused on developing teaching strategies to meet students' needs, which was in line with research by Earl and Katz (2006). These teachers related their curious attitudes to their use of data:

*Not because Emily [the principal] told us we have to, but because we want the best for our pupils, and the data show me what to do and what has to be changed. I want to be a good teacher, so I cannot ignore what the data tell me. I have to find out what went wrong and why, and what I have to do to improve my teaching strategies (Karen [10]).*

In relation to inquiry-based working, the principal also referred to selecting and analyzing various types of data to improve the school's educational quality, which was in line with research by Marsh and Farrell (2015) and Uiterwijk-Luijk et al. (2017). Just like the teachers, the principal identified the teachers and herself as curious and eager. She noted that she encouraged them to act in an inquiring way because *decisions based on assumptions could be less valuable compared to decisions which were made after assumptions were investigated. You can't simply accept what you see or hear. In our daily teaching practices, we need to search for justification rather than acting intuitively.*

In discussing distributed leadership, the teachers reported being given permission from their colleagues and the principal to take the initiative and assume responsibility based on their expertise, as well as being encouraged to hone their ability to learn by exploring and experimenting:

*In our school, we are all so committed. We have such a freedom and space to initiate, and then, we form a study group ourselves to enquire things. Giving room is the most important thing we need. Then, we can take initiatives, learn together and develop ourselves and our teaching. (Eva [9])*

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1 Number between brackets are teachers' years of experience

The teachers' feedback reflected research findings by Spillane (2012a) and Harris (2014). Furthermore, being given space to take responsibility appeared to be crucial to Anna [2], Karen [10], Ella [8], Lynn [8], Kate [9], and Eva [9]. In line with findings by Hulpia et al. (2009) and Thoonen et al. (2012), the teachers linked the relationship between their ability to take the initiative and assume responsibility to their sense of professional efficacy, job satisfaction, and commitment.

*Without the ability to take initiatives and use my expertise, I would not be so committed. Moreover, I would not even stay at this school. I would try to find another school (Kate [9]).*

The principal in turn highlighted the importance of leveraging teachers' expertise to strengthen their commitment through their participation in decision-making. As such, her response was in line with findings by Pineda-Báez et al. (2019) and Szeto and Cheng (2018). Noting the varying expertise of the different team members, the principal also acknowledged that others may be better equipped than her to reach a particular goal or resolve a specific problem. Here, her response was in line with the findings of Spillane (2012a). The principal also noted the importance of encouraging teachers to take leadership roles and creating an environment in which the use of knowledge and support were commonplace. She expressed confidence in the teachers' knowledge and experience, which led her to encourage them to take on leadership roles. In this sense, the principal paid continuous attention to teachers' collective efficacy and sense of well-being.

With regard to the research question in the present thesis—*How do teachers and their school leader perceive inquiry-based working and distributed leadership as being related to realizing educational change?*—10 out of 11 teachers mentioned inquiry-based working as a method of working that supports initiative-taking and sharing expertise. In addition, they added that data provide new information and complement existing knowledge. As summarized by Fay [4]:

*When we use data such as student results, observations, or conversations with students and parents, this way of working provides us information based on facts. I can't ignore the facts, so I have to initiate. Besides, the facts help me to feel confident. So, inquiry-based working supports and encourages us to undertake the necessarily actions and take initiatives.*

Using a combination of curiosity and available data encouraged the teachers to take the initiative and share their knowledge. One teacher did not mention this relationship due to her strong focus on the classroom as her teaching group included a higher-than-average number of students with special educational needs or who had recently joined the school. However, most teachers reported

that inquiry-based working helped them understand the required changes and encouraged them to take the initiative both in their daily teaching practices in the classroom and at the school level.

*When I deepen my knowledge by using data, I feel more comfortable to share my opinion and to take responsibility. Then, I have confidence in myself and that I am doing a good job. So, data and knowledge help me to stand up (Lucas, [17]).*

The school principal explained the relationship between inquiry-based working, distributed leadership, and the realization of educational change as follows:

*Realizing educational change is a daily coming around challenge. Using data and working in an inquiry-based way offer us information about why we have to change and what we have to change. So, why and in which way we can improve our education and teaching strategies. And I am convinced of the fact that when teachers are able to utilize their expertise in these change processes, first, their expertise will be strengthened by the data. Second, when teachers can take a leadership role based on their expertise, they may feel like owners of the changes. And everybody wants to experience ownership instead of listening to someone who tells you what to do. And last, I believe that in this way their sense of efficacy will reinforce as well as their joy, which in my opinion is an important part in commitment. And in a committed team, you can realize a lot. I am the principal, but I cannot realize educational change on my own, so involving my team is very important to me.*

Due to her emphasis on necessary educational changes, the principal related teachers' ability to take the initiative to their sense of professional efficacy and, for this reason, encouraged the teachers to engage in inquiry-based work, such as by adopting an inquiring habit of mind (Earl & Katz, 2006).

Although the teachers and principal agreed that inquiry-based working and distributed leadership were meaningful, they differed in their focus and thoughts on why this might be. The teachers cited their natural need for space to take the initiative and use their expertise, with a particular focus on the classroom; meanwhile, the principal emphasized teachers' participation in decision-making processes and educational development at the school level. The principal's rationale was as follows: leveraging teachers' expertise can strengthen their commitment, and others may be better equipped than she to attain a particular goal. The principal's confidence in the teachers' expertise enabled her to create an organizational culture in which sufficient space and shared expertise were the norm. She regarded teachers' expertise, particularly the differences in teachers' expertise, to be inherent to processes such as taking the initiative and assuming responsibility.

In turn, the teachers' perspectives reflected their eagerness to learn. They sought specific expertise and aimed for certain goals, which also contributed to the organization and to their sense of fulfillment at work (Ross, Lutfi, & Hope, 2016).

In discussing the realization of educational change through inquiry-based working and granting and adopting leadership roles, both the principal and teachers emphasized the importance of a team culture characterized by trust and transparency, which was in line with previous findings by Fink (2016). Firstly, by focusing on teachers' commitment to educational development, the principal prioritized an open and transparent organizational culture to encourage team spirit and trust: *"I think what my team needs from me is concern and trust and response. But specifically trust, I need to be very confident and transparent."* Secondly, nine out of 11 teachers also reported that an open and respectful organizational culture was an important factor in collectively resolving educational problems, sharing knowledge, creating shared meaning, and participating in leadership, as well as ensuring acceptance of one another. The teachers regarded such a culture as crucial for taking the initiative and sharing expertise, which they said required a sense of security. Jenna [9] and Lynn [8] also highlighted the importance of respect for each other as professionals, though they linked their answers to previous negative experiences in other schools that lacked an openness and in which they had experienced hierarchical leadership. Jenna and Lynn specifically referred to the principal's role in relation to their strong need to be listened to.

Therefore, in discussing how inquiry-based working and actively participating in leadership related to realizing educational change as a team, the team members and the principal acknowledged that both leadership distribution and inquiry-based working played an important role in strengthening their contributions to change. Educational changes were said to be based on data and teachers' inquiry habit of mind and specific expertise, which reinforced the teachers' feelings of efficacy and confidence and encouraged them to take the initiative and assume responsibility to *"be the best teachers and realize the best education for our pupils"* (Fay [4]).

## Discussion

Previous studies have noted a positive relationship between inquiry-based working and distributed leadership on teachers' change capacity (Brown et al., 2017; Datnow & Hubbard, 2016; Deppeler & Ainscow, 2016; Klar et al., 2016; Schildkamp, 2019; Uiterwijk-Luijk et al., 2017). The present study explored how teachers and the school principal perceived this relationship and analyzed whether the relationships were meaningful in their day-to-day practices. The respondents explained how data, and their curiosity, which they assumed to be inherent to inquiry-based working, guided them in relation to changes that needed to be made. In turn, inquiry-based

working generated a feeling of security that encouraged the respondents to take the initiative and assume responsibility when realizing educational change both in the classroom and at the school level. Moreover, the teachers reported the need to be involved in leadership and inquiry-based working and described how change was part of their work and undertaking changes together was appropriate. Such viewpoints appear to be conditional on the teachers' commitment to their school's goals and school development. In addition, the ability to be involved in leadership appeared to have a reinforcing effect on the teachers' sense of professional efficacy and job satisfaction, which was line with the findings of Lauermaun and Karabenick (2013). These researchers found that teachers with a strong sense of professional efficacy were more open to new ideas to effectively meeting students' needs.

The teachers' and principal's perceptions of inquiry-based working were in line with the findings of Marsh and Farrell (2015) and Uiterwijk-Luijk et al. (2017) in relation to teachers' inclination to systematically collect and analyze various types of data to improve performance at both the classroom and school level. In addition, in general, their perceptions of distributed leadership were in line with the concept proposed in the present study. The team members who were best-equipped to achieve a particular goal were free to take on leadership roles, which meant that teachers' expertise was employed, responsibility was shared, and decisions were made collectively (Binkhorst et al., 2018; Harris, 2014; Spillane, 2012a). Previous research has indicated that teachers' years of experience and their education level may be relevant to inquiry-based working, distributed leadership (e.g., Kocór & Worek, 2017), and realizing educational change (Bellei, Vanni, Valenzuela, & Contreras, 2016). Therefore, these variables were incorporated in the present study. However, as only 12 teachers were interviewed in the present study, no conclusions were drawn based on these variables. Therefore, whether years of experience and educational level are related to the three constructs should be handled carefully.

For the principal, a committed team was essential to realizing educational change, which in turn prompted her to encourage the teachers to take the initiative, assume responsibility, and participate in decision-making at the school level. This finding was in line with prior research by Pineda-Báez et al. (2019), Szeto and Cheng (2018), Moin (2018), and Delegach et al. (2017). Moin (2018) found that teachers who were committed to their schools had a strong belief in and acceptance Of their school's vision of educational change. Delegach et al. (2017) also noted that committed teachers were more likely to initiate and realize educational change and observed that inviting teachers to use their expertise could reinforce their commitment. The best-equipped team member should be in charge of realizing any particular educational aim (Spillane, 2012a). The principal also encouraged the teachers to engage in inquiry-based working and make use of data. Inquiry-based working

appeared to be helpful for making sense of information, while curiosity, asking questions, and gathering data could substantiate new knowledge and beliefs. In the present study, the teachers' and principal's perceptions were found to be congruent. Such congruence may enhance the teachers' sense of efficacy, as Ham, Duyar, and Gumus (2015) showed that congruence in the approach of principals and teachers to leadership was positively related to teacher self-efficacy. The same authors also found that congruence in perceptions was an important aspect of a school's capacity to change.

A difference was noted in the teachers' and principal's focus on taking the initiative and assuming responsibility, using teachers' expertise, and the relevance of inquiry-based working. While the teachers were focused on their day-to-day practices in the classroom, the principal was focused on educational development at the school level. This difference may be explained as follows: principals invest in committed teams because committed teachers are more likely to initiate and realize educational changes that better meet students' needs. Appealing to teachers' expertise can reinforce their commitment (Delegach et al., 2017). Therefore, the principal encouraged the teachers to participate in decision-making at the school level, as well as to use their expertise and take the initiative. Meanwhile, as her emphasis was on making improvements at the school level, she concentrated on creating an inquiry-based working culture by encouraging teachers to adopt an inquiry habit of mind to satisfy their eagerness to learn (Uiterwijk-Luijk et al., 2017). In short, the principal's focus reflected her role as a formal leader who was accountable for the school's overall educational quality. Furthermore, although the teachers were likely to share new knowledge with their colleagues, their perspectives appeared to strongly reflect their individual curiosity. In addition, the teachers sought to use their specific expertise and aim for certain goals both in their day-to-day teaching practices and at the school level. For this reason, the teachers made frequent reference to their daily teaching practices and responsibilities in the classroom. These aspects, as well as students' well-being and educational results, were the teachers' first priority. As such, the differences in focus between the teachers and the principal were reasonable.

The results confirmed that an open, transparent, and trusting organizational culture was crucial to encouraging teachers to take the initiative, share knowledge through inquiry-based working, collaborate, and realize change. Such a culture made the teachers feel appreciated, which was essential to their comfort in stepping forward, exploring, and learning collectively. These findings were in line with prior research by Fink (2016) and Ross et al. (2016), who noted that employees express a need to trust their colleagues and work collaboratively. In addition, congruency was found in the present study, as the principal recognized the teachers' need for trust and transparency and acknowledged that her role and behavior were essential to

creating and stimulating such an organizational culture. This was in line with findings by Fink (2016), who observed that trust was strongly connected with teachers' and schools' performance.

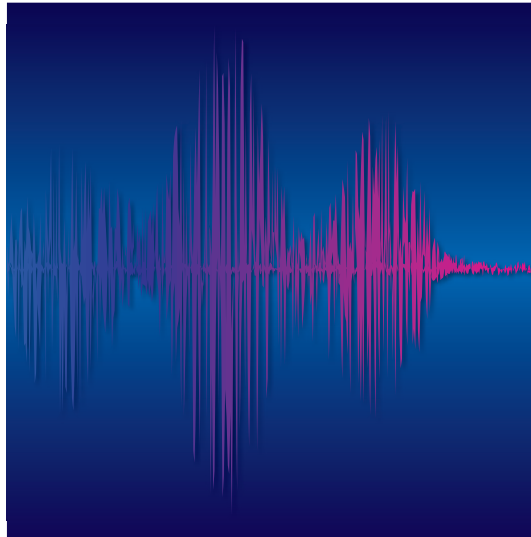
## **Conclusion**

The present work provides deeper insights into teachers' and their principal's perceptions of distributed leadership and inquiry-based working, particularly in relation to the realization of educational change. The teachers' enthusiasm when discussing how inquiry-based working empowered them and encouraged them to use their expertise and take the initiative was striking. The teachers frequently mentioned their desire to be a good teacher for their students and to perform well at work. Nurturing this enthusiasm and professional commitment is important for school leaders. One way of doing so, as illustrated by the school leader, would be to express confidence in and focus on the team's abilities and expertise, as well as encouraging teachers to be curious and adopt an inquiring attitude.

This study pertains to a Dutch context in which schools are largely autonomous. In many countries, including the Netherlands, educational systems reflect a governmental mandate of risk-based control. Such approaches could be a concern, though they do not necessarily prevent schools from allowing teachers to take the initiative, accept greater responsibility, or encourage inquiry-based working, all of which appear to be vital in ensuring that teachers contribute to educational change. Both teachers and school leaders are advised to leverage other factors to better meet teachers' needs, particularly the provision of space, support, transparency, and trust.







# 5

## CHAPTER

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### HOW SCHOOL LEADERS PERCEIVE AND APPLY THE DISTRIBUTED LEADERSHIP PERSPECTIVE IN THEIR SCHOOL

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This chapter is based on: Amels, J., Krüger, M. L., Suhre, C.J.M., & Van Veen, K. (2020). The relationship between primary school leaders' utilization of distributed leadership and teachers' capacity to change. *Educational Management Administration & Leadership*, DOI: 10.1177/1741143220915921

**Abstract**

*Although it is generally known that distributed leadership is relevant for reinforcing teachers' capacity to change, how leadership roles are distributed among teachers largely depends on how principals perceive distributed leadership. Specifying principals' perceptions and how these perceptions are related to teachers' capacity to change leads to theories about knowledge and beliefs of leaders regarding distributed leadership that are crucial for achieving educational changes as a team. Combining questionnaire data from 787 Dutch primary school teachers and interview data from 58 principals in a parallel mixed methods design, this study shows differences in how school leaders distribute leadership roles. In addition, the results show that several aspects of teachers' capacity to change—namely joint work, collegial support, knowledge sharing, self-efficacy and teachers' internalization of school goals—are more present in schools in which school leaders distribute leadership among teachers than in schools in which they do not.*

## Introduction

In constantly changing and developing societies, teachers' ability to adjust and improve their practices is essential (Greany, 2018). Teachers need a certain capacity to change, which encompasses conditions and skills at the level of the school and the teacher that strengthen teachers' professional learning and teaching strategies (Stoll, 2009; Thoonen et al., 2011).

Research on teachers realizing change showed that, in addition to factors such as teachers' expertise, school culture and team members' interrelationships, distributed leadership is relevant (Brown, McNamara, O'Hara, Hood, Burns, & Kurum, 2019; Leithwood, Patton, & Jantzi., 2010). Distributed leadership involves teachers taking and granting leadership roles according to expertise and problems to be addressed; they do so by taking initiative and responsibility (e.g., Harris, 2014; Spillane, 2012a). Whether school leaders adopt distributed leadership as a starting point for their school organization is dependent on their perceptions of this leadership perspective (Harris & DeFlaminis, 2016; Woods, 2016), and these perceptions in turn largely depend on their judgments of teachers' competences and expertise (Jones & Harris, 2014; Spillane et al., 2007).

The significance of principals' perceptions of distributed leadership raises the question of how school leaders' perceptions and their application of the distributed leadership perspective are related to teachers' capacity to change. Insights into these relationships can lead to theories on what principals' knowledge and beliefs on distributed leadership should entail to realize educational change as a team. With this study, we investigate how principals perceive and apply distributed leadership and whether specific aspects of teachers' capacity to change are more present in schools in which principals apply a distributed leadership perspective than in schools without such a perspective.

## Theoretical conceptualizations

### *Leadership from the distributed perspective*

The distributed leadership perspective is increasingly of interest to school leaders, researchers and policy makers, primarily because schools across the world face complex and diffuse demands to respond to shifting and changing societies. Following the work of Spillane (e.g., Spillane, 2012a; Spillane, Halverson, & Diamond, 2004; Spillane & Healey, 2010), we conceptualize distributed leadership as a perspective on leadership in the organization, which then manifests as a dynamic process among all team members. In this study, the school team encompasses the teachers, and all other employees, such as educational assistants or teachers having other formal tasks. Depending on the types of problems to be addressed, team members can take leadership roles depending on their knowledge, affinities and experience. Thus, the best equipped or most skilled team member can adopt a leadership role with respect to a particular goal. Distributed leadership can involve both formal and informal leadership roles, and responsibility is shared among all team members (Spillane, 2012a). Principals, as the formal leaders, should aim to align talent and expertise to the school's vision and goals and recognize that a systematic analysis of how these goals are developed over time must be developed (Yeigh, Lynch, Turner, Provost, Smith, & Willis, 2019).

In addition to depending on the subject matter, how distributed leadership is effectively applied in a school depends on the school leader's perception of the concept (Harris and DeFlaminis, 2016; Woods, 2016), their beliefs about the expertise and personal capabilities of the school's teachers (Jones & Harris, 2014; Spillane et al., 2007), and understandings of the context and the school's needs (Day, Gu, & Sammons, 2016). A principal's attitude is of importance as well. For example, as an autocratic leader the principal can make decisions because he or she has the authority; by contrast, in the distributed perspective principals facilitate, broker and support teachers to take a leadership role, which requires different skills to fit this role (Yeigh et al., 2019). Furthermore, because trust encompasses aspects such as benevolence, reliability, integrity, openness and respect, a principal's trust is an essential condition in collegial support, sharing knowledge and expertise and adopting and granting leadership roles (Fink, 2016; Spillane & Healey, 2010). Principals who grant leadership roles by showing trust can encourage teachers' professional efficacy (Fink, 2016).

The distributed leadership perspective can be interpreted in various ways (Harris & DeFlaminis, 2016; MacBeath, 2005). For example, MacBeath (2005) distinguished three: First, when school leaders grant space to team members to reach a longer-term goal of school improvement, they are using strategic leadership distribution. Second, pragmatic distribution occurs when principals delegate tasks ad hoc

because of increasing demands (see also Holloway, Nielsen, & Saltmarsch, 2018). The delegated tasks may be related to organizational or educational subjects. Third, formal distribution means that school leaders grant teachers' influence by formally assigning them leadership roles. Such a leadership distribution can help justify leadership and power over others (also see Hargreaves & Fink, 2008).

In line with these ways, two approaches can be distinguished in distributed leadership: (1) distributed leadership as a tool to analyze leadership practices in the school and (2) distributed leadership as a framework to organize leadership. This study follows the second perspective, as we investigate school leaders' perceptions of distributed leadership and whether they recognized this perspective as a way of working in their school. We base our description of distributed leadership on the works of Spillane (2012a) and Harris (2014), which emphasize strategic distribution. We summarize their visions on distributed leadership as follows:

In distributed leadership, leadership is not assumed to be feature of one person but a feature of the team as a whole; for example, if team members each have specific expertise, they may take on a leadership role based on this expertise. This is described as "informal leadership". In addition, team members can grant one another such leadership roles. Teachers' participation in decision-making at the school level and shared responsibility are features of distributed leadership.

### ***Teachers' capacity to change***

We posit that, because societies' demands continually change, teachers' capacity to change represents a competence; teachers can develop such a dynamic feature over time. This change capacity refers to the extent to which educators are able to maneuver on externally (e.g., mandated by government) or internally (e.g., required by the school board, team members themselves) initiated innovations (e.g., Geijsel et al., 1999). To develop this capacity, teachers as well as the school itself must be engaged in continuous learning for the purpose of enhancing student learning (Harris et al., 2015; Stoll, 2009). In the present study, teachers' capacity to change refers to teachers realizing educational change by engaging in peer-collaborative development and developing teaching practices aimed at students' cognitive and social-emotional development and improving student learning.

In line with Stoll (2009, 2013), Ho and Lee (2016), Geijsel et al. (1999) and Geijsel et al. (2009), we operationalize teachers' capacity to change using three aspects: (1) interpersonal (teacher collaboration), (2) organizational (teachers' professional learning activities) and (3) personal (motivational variables). First, collaboration to attain certain goals contributes to realizing educational change (Ho & Lee, 2016). In interactions, teachers meet nonroutines and collectively make sense of changes by using their body of knowledge, which will determine whether and how they will implement changes (Hadfield & Ainscow, 2018). Teachers' capacity to change in

terms of collaboration is expressed as joint work, which is the most intensive form of collaboration and is intended to develop and reach goals or solutions with a high level of task interdependency (Little, 1982). Another feature of collaboration is collegial support, which may enhance teachers' collective efforts to develop and improve their teaching and learning (Philpott & Oates, 2017).

Second, regarding the organizational aspect, teachers who undertake professional learning activities keep themselves up to date on educational developments and new issues, which reflects their use of opportunities for active learning (Geijsel et al., 2009). Furthermore, teachers who are engaged in such activities are likely to experiment, reflect and share knowledge and experiences to learn at the team level (Camburn & Han, 2017; Geijsel et al., 2009).

Third, the personal aspect is exemplified by motivational variables such as teachers' internalization of school goals, sense of self-efficacy and job satisfaction, because these motivational elements are of crucial importance in commitment and change (Thoonen et al., 2011). If teachers have a certain degree of self-efficacy and attain personal aims based on the school goals, they will be more strongly committed, which can strengthen their contributions to educational change (Geijsel et al., 2009). Here, teachers' sense of self-efficacy is described as a sense of "yes, I can"—a task-specific belief that one is able to perform a specific behavior successfully and can organize and execute the actions required to produce the given levels of achievement (Payaras, 1996). Job satisfaction reflects positive emotional feelings achieved from positive experiences within one's job (Singh & Kaur, 2010). Satisfied teachers feel more comfortable in contributing and embracing change (Thoonen et al., 2011).

Existing research has focused on questions about how distributed leadership affects teachers' ability to feel ownership, empowerment, self-efficacy and well-being in the organization. Teacher involvement in leadership can enhance teachers' self-efficacy and motivation (Day et al., 2016) and lead to strong commitment among teachers to organizational performance (Ross et al., 2016). Other studies have investigated the impact of distributed leadership on teacher collaboration. Brown et al. (2019) stated that a spread of leadership roles is helpful in teacher collaboration and collegial support, because such distribution positively affects teachers' feelings of being respected; in addition, teachers' need to influence educational changes is positively related to teacher collaboration. As the formal leader consciously acts on this teacher need, educational practices may improve further (Von Dohlen & Karvonen, 2018). In addition, a distribution of leadership roles contributes to realizing change because in collaboration, professional and collaborative learning will be strengthened (Hadfield & Ainscow, 2018). However, few studies have explored how distributed leadership practices and teachers' capacity to change are related (Bagwell, 2019).

## Scope of the study

Researchers assumed that distributed leadership is relevant for reinforcing teachers' ability to change (e.g., Diamond & Spillane, 2016; Harris, 2014; Holloway et al., 2018; Spillane, 2012a; Yeigh et al., 2019). Furthermore, they assumed that whether and how leadership roles are distributed depends on (among other things, e.g., structural and cultural aspects) the principals' perceptions of distributed leadership (Harris & DeFlaminis, 2016; Woods, 2016). However, insights into the *how* of the leadership distribution practice and its relationship to realizing educational change are scarce (Bagwell, 2019). We aim to acquire a better understanding of how school leaders perceive the distributed leadership perspective and apply this perspective in their schools and whether aspects of teachers' capacity to change are more present in schools in which the principal applies the distributed leadership perspective than in schools without such a perspective.

We formulate our research questions as follows:

1. How do primary school leaders perceive and apply the distributed leadership perspective in their schools?
2. Which aspects of teachers' capacity to change are more present in schools in which principals apply a distributed leadership perspective than in schools without such a perspective?

## Methods

### ***Context, participants and procedures***

In Dutch primary education, children aged 4–12 years receive education arranged in eight grades. In the Netherlands, curricula are shaped by individual schools, with attention to the national standard framework, which includes indicators. Although schools are autonomous, which is reflected in their policies related to pedagogical, personnel and financial management approaches, quality standards are applied to all schools, ensuring educational quality by the national inspectorate. The inspectorate's approach is risk based. Control over output results is central and schools can be asked to improve their educational quality when output results do not comply with the quality standards (Ehren et al., 2017). Annually, the output results of all primary schools are made public as well as the inspectorate's reports. Today, at the request of the Ministry of Education, Culture, and Science, teachers and principals of primary and secondary education, together with many stakeholders, are working jointly on a revision of the quality standards. Such a reform should result in a coherent national curriculum in which standards concerning knowledge and skills are concretely described. How and with what teaching methods and pedagogy schools realize the quality standards will be up to them, which was also the case during this study. The inspectorate holds schools accountable for their educational quality and output results. The extent to which team members are



allowed to be creative and take initiatives as well as their involvement in innovation is assumed to enhance the organization's capacity to learn and change (Johnson & Voelkel, 2019). Therefore, it is important for school leaders to exploit the expertise available in the team and encourage teachers to take initiatives and responsibility. Such a way of working can strengthen teachers' commitment and their involvement in change (Ross et al., 2016).

For this study, we used a convergent parallel mixed-methods design to explore the relationships between school leaders' perceptions of distributed leadership and teachers' capacity to change. In such a mixed-methods design, quantitative and qualitative data are collected in a single phase. The data sets are analyzed separately, and then the results from the analysis of both data sets are brought together (Cresswell, 2014).

The study was part of a larger study in which almost 500 Dutch primary schools were invited to cooperate and 65 schools located in the midwestern and eastern regions of the Netherlands ultimately took part (response rate 13%). The teachers of these schools completed a questionnaire (response rate 79%). If more than 10% of the data in a single questionnaire were missing, we excluded the questionnaire. We ultimately generated a sample of 787 teachers from 61 schools (for demographic characteristics of the teachers including their level of education, see Table 1).

**Table 1.** Teachers' demographic characteristics (N = 787)

| Demographic Characteristic               |  | <i>n</i> | %    |
|--|--|----------|------|
| Gender                                   | Female <sup>a</sup>                              | 703      | 89   |
|  | Male <sup>a</sup>                                | 84       | 11   |
| Years of experience in primary education | <4   | 77       | 9.8  |
|  | 5–9  | 158      | 20.1 |
|  | 10–14  | 168      | 21.3 |
|  | >15  | 383      | 48.7 |
| Class level taught                       | Grade 1 and 2                                    | 181      | 23   |
|  | Grade 3  | 90       | 11.4 |
|  | Grade 4  | 91       | 11.6 |
|  | Grade 5  | 76       | 9.7  |
|  | Grade 6  | 76       | 9.7  |
|  | Grade 7  | 77       | 9.8  |
|  | Grade 8  | 86       | 10.9 |
|  | Other function (e.g., special educational needs) | 107      | 13.6 |
| Educational level                        | No bachelor's or master's degree                 | 34       | 4.3  |
|  | Bachelor's degree                                | 549      | 69.8 |
|  | Master's degree                                  | 201      | 25.6 |

<sup>a</sup>The female/male distribution reflected that of the Dutch primary school teachers' population (87% female, 13% male; see [www.statline.nl](http://www.statline.nl)).

Two researchers concurrently interviewed the school leaders of the participating schools by telephone ( $n = 58$ ). Note that the sample's gender ratio (72.4% female [ $n = 42$ ], 27.6% male [ $n = 16$ ]) does not reflect that of the larger population of Dutch primary school principals (47% female, 53% male; see [www.schoolleidersregisterpo.nl](http://www.schoolleidersregisterpo.nl)). In the Netherlands, a professional standard (Andersen & Krüger, 2013) and a professional register (Dutch Register for Primary Education School leaders, 2018) for school leaders have both been recently developed. Although school leaders' registration in the professional register is mandatory, there are no consequences to date yet if school leaders do not register. In our study, all participating principals were registered, which means they completed an accredited leadership course at least at the post-bachelor level. The principals' experience at their school ranged from less than a year to 18 years.

Almost all schools ( $n = 56$ ) had a management team in which teachers with formal adjusted leadership roles took part. One school did not have a management team, as the teaching team was made up of only four teachers, and one principal consciously did not establish a management team as he regarded all team members to be involved in school development.

## **Instruments**

### ***Semi-structured interviews with the school leaders***

In a semi-structured telephone interview (see Appendix C), which lasted approximately 20 minutes and was recorded, first, questions were asked about the formal organizational structures in the school, and years of leadership experience of the principal. The interviewers read aloud their description of distributed leadership based on Spillane (2012a) and Harris (2014). Then, the principals were asked whether they apply distributed leadership in their schools and how they perceive distributed leadership. The interviewer asked questions such as "Do you recognize distributed leadership as a way of working in your school, and would you please describe your way of working?" and "Do you formally give leadership roles to teachers, and if so, why and to whom?" Next, interviewers asked them to give examples of their answer by identifying contextual practices they considered exemplary with regard to distributing leadership roles. Principals were also asked whether they give space to teachers with specific expertise to take initiatives themselves, and if so, why and how.

To adhere to ethical norms, interviewers presented the purpose of the study to the participants before the interviews. Interviewers asked for their consent to take part and to publish findings as well. We explicitly noted that no personal details would be identified and each participant could withdraw from the study at any time. All participants granted permission.

### ***Teacher questionnaire***

To measure teachers' capacity to change, we developed a questionnaire with items drawn from or based on existing scales (Geijsel et al., 2009; Oude Groote Beverborg et al., 2015). All items used 5-point Likert scales, ranging from 1 ("totally disagree") to 5 ("totally agree"). We piloted the questions with 10 primary school teachers working in grades 1–8 and incorporated their feedback into the final questionnaire.

The capacity to change questionnaire contained 56 items measuring the following aspects: (1) teachers' collaborations, (2) teachers' undertaking of professional learning activities and (3) three motivational variables: the extent of teachers' internalization of school goals into personal aims, teachers' sense of self-efficacy and job satisfaction. All aspects were divided into subscales. Table 2 displays the subscales for each category, the number of items in the subscales and a sample item per subscale.

**Table 2.** Overview of the capacity to change categories and subscales in the teachers' questionnaire (N = 787), with example items and number of items per subscale

| Category                                     | Subscale <sup>a</sup>                               | Example item   | Number of items | Cronbach's $\alpha$ |
|--|---|--|-----------------|---------------------|
| Collaboration                                | Joint work  | Within our team, we evaluate whether a new approach works.                       | 6               | .84                 |
|  | Task interdependency                                | In order to do our job well, we need to operate as a team.                       | 4               | .72                 |
|  | Collegial support                                   | In my teaching, my colleagues support me by giving feedback                      | 6               | .85                 |
|  | Keeping up to date                                  | With regard to professional development, I take initiatives myself.              | 6               | .86                 |
| Undertaking professional learning activities | Experimenting                                       | I try new ways of instructional strategies.                                      | 4               | .74                 |
|  | Reflecting  | I think about the way I carry out my work.                                       | 5               | .80                 |
|  | Sharing knowledge and experience                    | Within our team, teachers share what they learn in courses or workshops.         | 6               | .89                 |
| Motivational variables                       | Internalization of school goals into personal goals | I absolutely endorse the goals my school wants to realize and act in such a way. | 4               | .80                 |
|  | Self-efficacy                                       | I feel that I'm successful in my work.   | 5               | .81                 |
|  | Job satisfaction                                    | Mostly, I go to work with pleasure.  | 5               | .88                 |

<sup>a</sup>1 = "totally disagree," 2 = "partly disagree," 3 = "neither disagree nor agree," 4 = "partly agree," and 5 = "totally agree."

## Data analysis

### Analysis of the interviews

The interviews were transcribed verbatim. In the process of analysis, the starting point was whether the principals distributed leadership roles among their teachers. Two researchers independently analyzed the interviews into two categories set by the first author in Excel. First, principals were categorized as "Yes, I distribute leadership roles in my team" when they distributed leadership roles in line with our description, with the emphasis on strategic distribution: the principal granted space to teachers to take initiatives focused on realizing educational improvement and based on expertise (e.g., "I consciously make use of informal leaders, because they can inspire and encourage since they have specific expertise" [Evelyn]). Second, principals were categorized as "No, I do not distribute leadership roles" if a "no" was included in principals' responses (e.g., "No, that's not how we work in our school" [Ian]).

Using an inductive approach (Cresswell, 2014), we observed concepts such as "partly apply distributed leadership" and "not described concretely" and created codes for these responses. We also distinguished perceptions of formal and

pragmatic distribution (MacBeath, 2005). In a formal distribution, school leaders formally assigned leadership roles to teachers (e.g., "Some teachers are specialists. Functionally, they have other responsibilities" [Dominic]). Although the interview included no questions about delegating tasks, some principals noted delegating tasks to teachers and, as such, used the pragmatic way of distribution (e.g., "I have to distribute leadership because I can't do everything on my own. So, I delegate tasks to my teachers" [Iris]). Both researchers checked the analyses of the categories (Cohen's  $\kappa = .82$ ; 95% agreement in coding), and discussions settled any differences easily. Relevant fragments were connected with the description of the findings.

### ***Analysis of the questionnaire***

Regarding the questionnaire, we performed an exploratory factor analysis in SPSS Version 24 to determine whether the items loaded on the presumed factors. We found that, indeed, with good reliability, they grouped together as assumed (see Table 2).

### ***Multilevel analysis***

As our questionnaire data were nested, we performed multilevel analysis to investigate our second research question (Which aspects of teachers' capacity to change are more present in schools in which principals recognize a distributed leadership perspective than in schools without such a perspective?) (Tabacknick & Fidell, 2013). The dependent variables included collaboration, professional learning activities undertaken and the three motivational elements. The independent variable was the groups of principals regarding their utilization of distributed leadership in their school. The group of principals that partly applied distributed leadership was small ( $n = 5$ ), and the numbers of participants in the groups were not normally distributed (see Table 3). Moreover, the responses of those five principals did not meet the distributed leadership perspective as defined in our study. Therefore, we transformed the three groups to a dichotomic variable: principals who did not apply distributed leadership in their school (Group 1,  $n = 21$ ) and those who did (Group 2,  $n = 33$ ).

**Table 3.** School leaders' interpretations of distributed leadership in the context of realizing change

| Interpretations                                    | <i>n</i> | School Leaders <sup>a</sup>   |
|--|----------|---|
| I do not apply distributed leadership in my school | 16       | Jill [5], Finn [17], Lindsey [1], Jennifer [0,5], James [9], Amy [6], Suzanne [9], Ian [9], Mick [8], Jayda [1], Rose [8], Carice [3], Joanne [5], Collin [9], Katie [0,2], Amelie [1]  |
| I partly apply distributed leadership in my school | 5        | Luke [4], Lucy [6], Abby [1], Rick [11], Kyra [7]   |
| I apply distributed leadership in my school        | 33       | Tess [7], Laurie [9], Indy [5], Jesse [5], Jade [1], Emily [17], Julian [18], Marly [10], Maud [1], Alice [6], Romy [11], Tara [7], Esmay [8], Evelyn [4], Sue [4], Grace [14], Hannah [11], Chloe [2], Joshua [1], Megan [7], Lenn [5], Rosanne [12], David [15], Nicholas [6], Chris [3], Isabelle [6], Charlotte [14], Dominic [4], Britt [8], Liz [3], Vivian [6], Iris [3], Justin [5] |
| Not described concretely                           | 4        | Nikki [6], Joyce [11], Olivia [4], Jasmin [4]   |

<sup>a</sup> Number of years of experience of the principal is between brackets; names of the principals are fictitious.

## Results

### Interview results

First, we classified the principals' responses into four categories: (1) principals who did not apply distributed leadership as a way of working in their school, (2) principals who partly applied distributed leadership in their school, (3) principals who applied distributed leadership as a way of working in their school and (4) principals for whom responses could not be categorized (see Table 3). Second, with regard to our first research question (How do primary school leaders perceive and apply the distributed leadership perspective in their school?), we scrutinized the group of 33 school leaders who said they used distributed leadership as a way of working in their school, as they interpreted the concept in different ways. Therefore, we distinguished principals who consciously granted space to teachers to take initiatives focusing on educational improvement (i.e., strategic distribution;  $n = 18$ ). Examples of this type of distributed leadership are as follows:

*Teachers have a lot of room to take initiatives, and I encourage them to experiment. In meetings, they have to share what they're doing and experiencing... Also, I discuss these things with them, for instance, during performance evaluations or by walking around. "I think you're good at this or at that, what would you like to do in favor of yourself and our school?" I stimulate and encourage them to take such a role. Everyone has some talents and that's why you're here: We want to make use of your talents and expertise in order to develop our educational quality further. (Hannah [11]<sup>2</sup>)*

<sup>2</sup> Number between brackets are school leaders' years of experience

Laurie's teachers undertook many initiatives. They owned and initiated processes to improve teaching strategies. As she indicated:

*The way I see my role as the formal leader is to embrace decisions the teachers made. They know what has to be changed since they're experts in teaching. (Laurie [9])*

Four of the 33 principals delegated tasks to teachers. Indy, Iris, Romy and Charlotte used pragmatic distribution: They perceived the principal's job as too comprehensive for one person and, therefore, delegated tasks to teachers. For example:

*I've to share work because I can't do everything on my own. It's too much and it is impossible for me to know everything. (Indy [5])*

Of the 33 principals who said they applied distributed leadership, 11 mentioned formal leadership distribution. Because of their own desires to be in control, they formally assigned leadership roles. For example, Esmay granted her teachers freedom and space by encouraging them to write a proposal underpinned by arguments related to issues they would like to change. If the proposals were in line with her view on what should be done in the school, she would make these teachers formally responsible for the project.

Furthermore, 27 of 33 principals who used distributed leadership related an organizational structure of teachers participating in sub teams to this leadership perspective. Sub teams worked on education- or organization-related subjects, which varied from organizing a school party, to searching for a new teaching method, to how student's results in, for example, math could be improved or how parents could be more involved in student learning. In all 27 schools, teachers were able to choose which sub teams they would participate in. Within these schools, 10 principals (Jade, Britt, Alice, Tara, Esmay, Evelyn, Lenn, Rosanne, Nicholas and Dominic) assigned the chairperson of a sub team, and eight of them gave the sub teams an assignment including targets. In the other two cases, the sub teams had to create the assignment themselves based on the targets the principal stated, and then the principal had to approve the assignment. One principal (Sue) was the chairperson of a sub team herself. In the other 16 schools, the sub teams themselves selected the chairperson, as explained by Tess [5]:

*The chairman can be a teacher who comes forward because he's an expert on the subject or has a strong affinity. Or teachers ask one of the colleagues to be the chairman, because they know that person is able to clearly formulate and monitor the agreements.*

Three of the six principals who did not relate an organizational structure of sub

teams to distributed leadership (Maud, Chloe and Joshua) were considering developing a new organizational structure. They were only a few years active in their current school (one year, two years and one year, respectively). The interviews with the other three principals contained no supplementary questions with respect to sub teams.

The five principals who partly applied distributed leadership in their schools did not require their teachers to take initiatives. However, they reported that their teachers were involved in decision-making processes. In addition, according to three of these principals (Luke, Rick and Abby), their teachers were less likely to take initiatives because they were focused on their classrooms.

Sixteen principals did not apply the distributed leadership perspective. Six of them (Lindsey, Jennifer, Jayda, Carice, Katie and Amelie) had less than four years' leadership experience. They related this relatively short leadership period to the fact that the team was not used to taking initiatives and responsibility because of prior leadership practices.

Finn, James and Suzanne were quite strict in describing their own role as a principal. For example:

*I'm the principal and I control many things. But, yeah, I'm the final responsible person.* (Finn [17])

Although the other seven principals replied they did not apply distributed leadership in their school, four of them (Jill, Collin, Mick and Ian) mentioned that teachers participated in decision-making about organizational issues. Amy, Joanne and Rose mentioned that they would like to distribute leadership roles. However, they assumed that their teachers were afraid to take on this responsibility:

*I would like to work in such a way, but I notice that they find it scary. It's scary to take such a role.* (Joanne [5])

In summary, for the 33 principals who reported consciously applying distributed leadership, differences in interpretations arose. They took our description, which we shared with the principals before asking about their interpretations and which strategy was emphasized, and, then, gave their own meanings to the concept of distributed leadership. In their meanings, differences emerged in terms of the extent to which the principals granted space and responsibility to the teachers, and controlled and steered changes in the direction of their own focus.



### ***Descriptive results of the teachers' questionnaire***

The descriptive statistics of the scales used (see Table 4) show that, on average, participants scored positive and relatively high on all aspects of teachers' capacity to change, as the midpoint of the scales was 3.0.

**Table 4.** Descriptive results of subscales (N = 787)

|  | <b>Subscale</b>                                     | <b>M<sup>a</sup></b> | <b>SD<sup>b</sup></b> |
|--|---|----------------------|-----------------------|
| Collaboration                                | Joint work  | 3.84                 | .78                   |
|  | Task interdependency                                | 4.33                 | .58                   |
|  | Collegial support                                   | 3.91                 | .71                   |
| Undertaking professional learning activities | Keeping up to date                                  | 4.20                 | .67                   |
|  | Experimenting                                       | 4.15                 | .63                   |
|  | Reflecting  | 4.44                 | .53                   |
|  | Sharing knowledge and experience                    | 3.81                 | .77                   |
| Motivational variables                       | Internalization of school goals into personal goals | 4.47                 | .59                   |
|  | Self-efficacy                                       | 4.19                 | .58                   |
|  | Job satisfaction                                    | 4.31                 | .69                   |

<sup>a</sup>M = mean value on a Likert scale that ranged from 1 ("totally disagree") to 5 ("totally agree").

<sup>b</sup>SD = standard deviation.

### ***Multilevel analysis results***

Our next step was to investigate which aspects of teachers' capacity to change were more present in schools in which principals applied a distributed leadership perspective than in schools without such a perspective. The independent variables were two groups of principals who did or did not apply distributed leadership in their schools, whereas collaboration, professional learning activities undertaken and the three motivational factors were the dependent variables.

The final model was similar to the full model and included the four sub variables of distributed leadership which were (1) teaching adopting leadership roles, (2) teachers granting one another leadership roles, (3) teachers' participation in decision-making, and (4) teachers' active involvement in school development. The final model significantly differed from the empty model for the dependent variables in terms of joint work, collegial support, sharing knowledge and experience, internalizing school goals into personal goals and sense of self-efficacy as aspects of teachers' capacity to change. The groups of principals as independent variables did not improve the fit of the model in terms of task interdependency, keeping up to date, experimenting, reflecting and job satisfaction (see Table 5 and Appendices A3, A4, and A6).

**Table 5.** Comparison of multilevel models predicting the capacity to change on the basis of principals' utilization of distributed leadership in their school

|   |  | Null Model M1              | Full Model M2              | Final Model* M2            |             |
|---|--|----------------------------|----------------------------|----------------------------|-------------|
|   |  | -2 Log-Likelihood (df = 3) | -2 Log-Likelihood (df = 4) | F-Value, df in Parentheses | p-Value**   |
| Collaboration                               | Joint work                                     | 1,376.785                  | 1,370.556                  | (170.926) 8.876            | <b>.004</b> |
|   | Task interdependency                           | 1,164.770                  | 1,168.563                  | (143.611) .215             | .645        |
|   | Collegial support                              | 1,341.186                  | 1,336.205                  | (156.103) 8.219            | <b>.006</b> |
| Professional learning activities undertaken | Keeping up to date                             | 1,346.148                  | 1,348.032                  | (141.836) 1.977            | .167        |
|   | Experimenting                                  | 1,257.936                  | 1,258.240                  | (149.890) 3.734            | .059        |
|   | Reflecting                                     | 1,034.920                  | 1,038.366                  | (142.891) .711             | .404        |
|   | Sharing knowledge and experience               | 1,364.957                  | 1,360.146                  | (167.154) 8.280            | <b>.005</b> |
| Motivational variables                      | Internalizing school goals into personal goals | 1,157.483                  | 1,152.078                  | (1.44.597) 10.471          | <b>.002</b> |
|   | Sense of self-efficacy                         | 1,135.134                  | 1,134.611                  | (1.47.749) 2.195           | <b>.033</b> |
|   | Job satisfaction                               | 1,250.712                  | 1,153.204                  | (1.65.685) 0.135           | .715        |

\*The final model is similar to the full model, and encompasses the four sub variables of distributed leadership.

\*\* $p < .05$ ; significant levels in boldface.

We used Cohen's (1988) values to assess the eta-squared effect sizes (small:  $\eta^2 = .02$ ; medium:  $\eta^2 = .13$ ; large:  $\eta^2 = .26$ ). We set the significance level at 5% for one-sided testing. The correlations of all the sub variables of capacity to change varied between .20 and .72.

With respect to collaboration, when the principals applied distributed leadership in the school, the extent of teachers' joint work ( $b(SE) = .35(.12)$ ,  $p = .004$ ;  $\eta^2 = .03$ ) and collegial support ( $b(SE) = .27(.09)$ ,  $p = .006$ ,  $\eta^2 = .002$ ) was significantly greater than in schools without such a leadership perspective. In schools in which principals employed distributed leadership, the teachers' scores were higher for working jointly and supporting one another collegially. However, because the effect sizes are small, we concede it is possible that the variance in the scores of joint work and collegial support may be explained by factors other than the principals' leadership distribution.

In terms of professional learning activities undertaken, the extent of teachers' sharing of knowledge and experience was significantly greater in schools in which principals applied the distributed leadership perspective ( $b(SE) = .30(0.11)$ ,  $p = .005$ ;  $\eta^2 = .04$ ). In schools in which leadership roles were distributed by the principal, the teachers shared their knowledge and experiences more than in schools in which principals did not apply such a leadership perspective. However, because the eta-squared value was small here as well, we concede it is possible that the variance in scores may be explained by factors other than the principals' employment of distributed leadership.

Regarding the motivational variables, the results showed that the extent to which teachers internalized school goals into personal goals ( $b(SE) = .20(0.06)$ ,  $p = .002$ ;  $\eta^2 = .003$ ) and teachers' sense of self-efficacy ( $b(SE) = 0.12(0.06)$ ,  $p = 0.03$ ;  $\eta^2 = 0.009$ ) were significantly greater when the principals distributed leadership. Teachers tended to internalize school goals into personal aims more and their sense of self-efficacy was stronger in schools in which the principal distributed leadership than in schools in which the principal did not apply distributed leadership. Again, however, the effect sizes are small, so we concede it is possible that the variance in scores of teachers' internalization of school goals and their sense of self-efficacy may be explained by factors other than the principals' leadership distribution.

## **Discussion and conclusions**

Our objective in this study was to gain insights into which aspects of teachers' capacity to change are more present in schools in which principals apply a distributed leadership perspective than in schools without such a perspective. Therefore, it was also relevant to investigate school leaders' perceptions of distributed leadership.

We can draw two conclusions from our study. First, for 33 of the 58 school leaders who indicated that they applied distributed leadership in their school, we found variation in perceptions such that strategic, pragmatic and formal distribution could be distinguished. That is, principals' interpretations of the distributed leadership concept varied from embracing teachers' decisions to change in a context of boundless space, to delegating principal's tasks because the job was too comprehensive for one person, to implementing an organizational structure by formally assigning leadership roles. Furthermore, 27 of the 33 principals who indicated they applied distributed leadership included a structure of sub teams working on organization- or education-related subjects in distributing leadership roles. We observed differences in how the sub teams were organized and whether the chairperson was assigned or chosen by the teachers. Second, notwithstanding the variation in principals' perceptions, the extent of teachers' joint work and collegial

support was greater in schools in which the principal applied distributed leadership than in schools without such a perspective. In addition, in distributed leadership schools the extent to which teachers shared knowledge and experiences and internalized school goals into personal aims was greater and teachers displayed a stronger sense of self-efficacy in their job. Thus, when principals distribute leadership, whether their distribution is strategic, pragmatic or formal, such distribution relates positively to teachers' collaboration, the extent to which they share knowledge and experiences, the extent to which they internalize school goals and their feelings of self-efficacy. In addition to differences in school leaders' interpretations of distributed leadership, the diversity in principals' distributed leadership perceptions indicates that this type of leadership is the outcome of a situated and social response to schools' internal need for change. This finding leads to two thoughts. First, although a blueprint of distributed leadership was not available (Tian et al., 2016), with regard to the relationship between principals' interpretations of the construct and realizing educational change, such an absence of a blueprint does not seem to be a hindering factor. Our results show that distributing leadership roles appears to have positive impact on various aspects of teachers' capacity to change, despite the differences in principals' interpretations. Second, of the 33 principals who used distributed leadership, 18 distributed roles strategically and, as such, were in line with our description of this leadership perspective, which emphasizes employing informal leadership roles based on teachers' expertise and affinities (Harris, 2014; Spillane, 2012a). The remaining principals distributed leadership roles not according to teachers' expertise but rather their own needs, such as a need to be in control or share tasks. These principals' responses are in line with the work of MacBeath (2005), as he integrated the pragmatic and formal leadership distribution into the concept of distributed leadership. Our findings confirm and add on the research of Harris and DeFlaminis (2016, p. 141), who argue that "there should be some latitude to view it in alternative ways and to see it through different lenses". Our findings displayed that a scope for freedom of thought around distributed leadership is not a hinderance but certainly may have its benefits, as interpretations are related to specific practices and each form seems to have impact on teachers' collaboration, collegial support, the extent to which they share knowledge and experience and internalize school goals, as well as on teachers' sense of self-efficacy.

With regard to the findings related to our second research question (Which aspects of teachers' capacity to change are more present in schools where principals apply a distributed leadership perspective than in schools without such a perspective?), teachers appear to be more focused on joint work and common goals, collegial support, and sharing knowledge and experience in schools wherein the principal applies a distributed leadership perspective. Also, in such schools, teachers' sense of self-efficacy appears to be significantly higher. However, the effect size of the difference between the means of schools with or without distributed leadership

on teachers' sense of self-efficacy is marginal. This means that the total variance explained is small. Nevertheless, since teachers' involvement in leadership may enhance their self-efficacy, teachers' commitment to organizational performance might be strengthened as well (Day et al., 2016; Ross et al., 2016).

The findings of significant differences in joint work and collegial support in schools with and without a distributed practice are in line with those of Brown et al. (2019). They indicated that if teachers are allowed to take initiatives in and responsibility for educational changes, their feelings of being respected may be positively affected. Such feelings appear to be essential in joint work and support. Joint work is the most intensive form of collaboration focused on reaching goals within a high level of task interdependency (Little, 1982). Therefore, we expected to find a significant difference in task interdependency as well; however, this was not the case; moreover, we found no significant difference for experimenting and reflection. Oude Groote Beverborg et al. (2015) noted that task interdependency and reflection have reciprocal roles when teachers are encouraged by their principal to consider and use their expertise. As mentioned previously, not all the principals considered teachers' expertise when distributing leadership roles.

Furthermore, we found no significant differences in teachers' job satisfaction between schools with and without a distributed leadership perspective. According to Singh and Kaur (2010), job satisfaction is a complex variable, influenced by individual characteristics and contextual factors; we did not integrate contextual factors in this study, which could explain why we found no differences in teachers' job satisfaction. The absence of contextual factors might be related to the small effect sizes and the minimal explained variance as well, since the understanding of the context by the school leader is of importance (Day et al., 2016). In addition to principals' leadership distribution, other factors appear to play a role in strengthening teachers' capacity to change. Yeigh et al. (2019) noted such factors might include contextual problems, perceived workload pressures and schools' own patterns of authority, rules and procedures.

Finally, in this study, we observed no differences in schools with or without a distributed leadership practice with regard to teachers' professional growth (i.e., keeping up to date, experimenting and reflecting). This result could have occurred because we did not specifically investigate schools in which the team was working on a specific teaching practice development, such as instruction practices, for which experimenting and reflecting are components in teachers' and schools' development. Another explanation may stem from the differences in the principals' perceptions of distributed leadership, considering that such differences might be related to differences in their perceptions of teachers' expertise (Jones & Harris, 2014). For example, as principals experience the need to be in control, they may have a

subjective view of both their own and teachers' expertise, which may hinder teachers from experimenting. However, as teachers' sharing knowledge and experience seems to be a relevant element in realizing change, it is important that principals view teachers' capabilities and expertise by employing trust and a growth mindset and give space to teachers to take initiatives and responsibility, because such a working environment can contribute to realizing educational change.

### **Limitations and future directions**

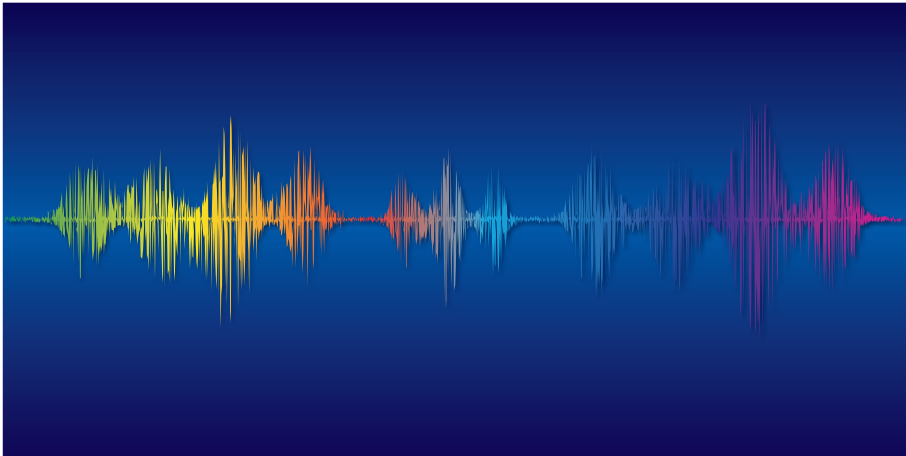
This exploratory study reveals limited evidence of effects of distributed leadership on teachers' capacity to change operationalized in terms of interpersonal, organizational, and personal variables since the effect sizes we found were small. However, principal's leadership on one's own is not enough to bring about change (Leithwood et al., 2010). For that reason, further research on how forms of distributed leadership can be effective in teachers realizing educational change is necessary. Besides, the way in which principals understand the school's context and needs is crucial in the relationship between distributing leadership and realizing change. Also, the extent to which distributed influence is perceived need to be judged over time (Day et al., 2016). Nor the extent to which the principals were responsive to their context was included in our interview questions, neither did we investigate principal's perceptions over time, which were limitations in this study. Therefore, follow-up research should be longitudinal and include information about the principal's responsiveness to the school's context and needs in the data collection and analysis. In future research, principals, staff and teachers should be interviewed in depth about the conditions, structures, traditions, relationships, expectations, and norms that make up the distributed leadership framework in the school. Then, congruency could be found in patterns of leadership distribution on school goals and the expertise of those who are involved in leadership practices.

The purpose of the interviews was to gain insight into how school leaders perceive the distributed leadership perspective and apply this perspective in their schools. As such, the short telephone interviews seemed sufficient and the responses were valid since principals could speak openly about their interpretations and perceptions of distributed leadership. We acquired a better understanding of how school leaders perceive the distributed leadership perspective and apply this perspective in their schools. Meanwhile, in leadership education and in principals' meetings, it might be worthwhile to make sense of the distributed leadership perspective collectively, to realize a shared interpretation of what is meant by this perspective. Then, attention can be paid to the rational, emotional, organizational, and family paths along distributed leadership, as was conceptualized by Leithwood et al. (2010), since these paths are related to schools' context and team members perceptions of leadership distribution. Such sensemaking processes can support principals in giving space to teachers to work collaboratively as a team on educational improvement, employing

all the available expertise in the school (Yeigh et al., 2019). Nevertheless, findings of this study confirmed the results of a range of previous research and enabled, through its mixed methods approach, new knowledge to be generated about the relationship between primary school leaders' utilization of distributed leadership and teachers' joint work, their collegial support, and sense of self-efficacy, and the extent to which they share knowledge and experience and internalize school goals focused on realizing educational change.







# 6

## CHAPTER

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## CONCLUSIONS AND DISCUSSION

## Introduction

Schools face the need to change and develop due to changing societies and increasing technical and digital possibilities (e.g., Biesta et al., 2015; Krüger, 2010b; Pllana, 2019).

However, educational change is complex (e.g., Commissie Parlementair Onderzoek Onderwijsvernieuwingen, 2008; Richardson & Placier, 2001; Slegers & Leithwood, 2010; Van Veen et al., in press). With regard to educational and teacher change, the embedding of teacher learning in the school needs to be considered as a key factor in successful school improvement, aimed to enhance the professional learning of teachers and to transform reform into learner-oriented teaching practice (Fullan, 1999; Stoll, 2009; Slegers & Leithwood, 2010). Furthermore, we followed Richardson & Placier's (2001) inside view on school improvement, which refers to the capacity of schools to transform themselves into learning environments for teacher change. An assumption within this inside approach is that educational change and processes of organizational learning are related. In teachers realizing educational change and in organizational learning, team members share their knowledge, construct new knowledge, or reconstruct existing knowledge in order to improve the functioning of individuals and the organization as a whole (Leithwood, Aitken, & Jantzi, 2001; Little, 1990). Cooperation can contribute to improving instructional quality and students' learning (Vangrieken et al., 2015).

In projects and policies aimed at educational improvement in primary schools in the Netherlands, the focus increasingly tends to be on data use, which, in turn, has an impact on schools' accountability (e.g., Schildkamp et al., 2017). Also, inquiry-based working refers to processes of organizational learning. Therefore, in this study, the approach of inquiry-based working and data use is explored. Inquiry-based working in short can be described as teachers working with an inquiry habit of mind, as well as teachers being data literate and using data at the school level and in classrooms (Krüger, 2010a; Krüger, 2018; Uiterwijk-Luijk et al., 2017).

In realizing educational change and inquiry-based working, leadership plays an important role to initiate, organize and monitor change in this way of working (Buske, 2018). At the same time, teachers' needs for professional autonomy to innovate and use their expertise seem to influence the success of educational change. Therefore, the distributed leadership perspective is adopted to explore the role of leadership, wherein teachers' expertise and affinities are employed, decisions are often made collectively and team members take—and are granted—a leadership role (Spillane, 2012a. Binkhorst et al., 2018).

The general aim of this study was to explore and provide insights into how inquiry-

based working and distributed leadership are related to teachers' capacity to realize educational change. Since teachers per school or even within schools can differ regarding the changes they initiate and adopt, the capacity to change can hardly be measured directly in the context of inquiry-based working. Therefore, in this dissertation, the capacity to change is operationalized more indirectly by exploring aspects that contribute to and indicate teachers' capacity to realize educational change.

With regard to change capacity, based on the work of Stoll (2009, 2013), Ho and Lee (2016), Geijsel et al. (1999), Geijsel et al., (2009), and Diseth, Danielsen, and Samdal, (2012), three aspects were distinguished that are all assumed to contribute to and indicate teachers' capacity to change: (1) teacher collaboration, which encompassed joint work, task interdependency and collegial support; (2) teachers' undertaking professional learning activities with the elements of keeping up to date, experimenting, reflecting and sharing knowledge and experiences; and (3) motivational variables, such as the internalization of school goals, a sense of self-efficacy and job satisfaction.

The study was guided by the following four research questions:

1. To what extent does teachers' inquiry-based working impact their capacity to change?
2. How do distributed leadership and inquiry-based working affect teachers' capacity to change?
3. How do teachers and their school leader perceive inquiry-based working and distributed leadership to be related to realizing educational change?
4. How do primary school leaders perceive and apply the distributed leadership perspective in their schools? Furthermore, which aspects of teachers' capacity to change are more present in schools in which school leaders apply a distributed leadership perspective than in schools without such a perspective?

The study started with a quantitative survey to investigate the relationships between inquiry-based working, distributed leadership and teachers' capacity to change (described in chapters 2 and 3). In addition, we performed a case study at one school in order to gain deeper insights into the underlying processes and into teachers' beliefs in their daily practices regarding the relationships found in the quantitative studies (Chapter 4). Meanwhile, school leaders were interviewed about their perceptions of distributed leadership and whether they perceive such leadership distribution to be present in their school. To examine which aspects of teachers' capacity to change are more present in schools wherein the school leader perceives distributed leadership to be present, we combined the data from the questionnaire and the interviews (Chapter 5).

This final chapter, first, provides an overview of the findings of each separate study. Second, overall conclusions that transcend the individual chapters are presented. Then, the research findings are discussed in light of the literature on inquiry-based working, distributed leadership and teachers' capacity to change. The final sections address the contributions of this dissertation, methodological considerations, limitations and directions for further research.

### **Summary of the main findings and conclusions**

#### ***Study 1: Impact of inquiry-based working on the capacity to change in primary education (Chapter 2)***

This study explored the relationships between teachers' inquiry-based working and their capacity to change. Seven hundred eighty-seven primary teachers completed a questionnaire (see Appendix A1) about inquiry-based working, distributed leadership and capacity to change. All the inquiry-based working variables—working with an inquiry habit of mind, demonstrating data literacy, data use at the school level and data use in classrooms—appeared to strengthen teachers' capacity to change. When teachers work was inquiry-based, they were likely to collaborate and learn, and also had a high sense of self-efficacy, and felt motivated to try to accomplish school goals.

Working with an inquiry habit of mind was found to be the most important driver of teachers' capacity to change. Data use at the school and classroom levels was also found to be a key aspect of inquiry-based working. Data use at the school level appeared to enhance teachers' likelihood to internalize school goals, work jointly and share knowledge and experience. Data use in classrooms can reinforce teachers' sense of task interdependency and self-efficacy and the extent to which they experiment, reflect and internalize school goals. No relationship was found between teachers' job satisfaction and any aspect of inquiry-based working.

Additionally, some interactions were found. Teachers working with an inquiry habit of mind were less likely to commit themselves to joint work when they also were data literate. Moreover, teachers working with such an inquiry habit of mind were less likely to share knowledge and experience when they used data at the school level. On the contrary, such teachers were more likely to reflect. Between the aspects of inquiry-based working and the motivational variables, no interactions were found.

This study also investigated the role of several background characteristics, such as gender, age, teacher's level of education and experience. None of these characteristics related to any aspect of inquiry-based working. Only teachers' educational level appeared to offer positive predictors of a teacher's willingness to keep up to date.

***Study 2: The effects of distributed leadership and inquiry-based work on primary teachers' capacity to change (Chapter 3)***

This study analyzed whether and how distributed leadership and inquiry-based working influence, directly or indirectly, teachers' capacity to change. The path model analysis resulted in four main findings. First, distributed leadership directly and positively affected collaboration as well as teachers' motivational aspects. Distributed leadership indirectly and positively affected teachers' professional learning activities. Second, inquiry-based learning directly and positively affected collaboration, teachers' engagement in professional learning activities and the motivational aspects. The third main finding was that inquiry-based working strongly and positively mediated the relationship between distributed leadership and all three elements of teachers' capacity to change. Thus, teachers' collaboration, initiatives to undertake professional learning activities, their sense of self-efficacy and the extent to which they internalize school goals and feel satisfied in their job could be strongly reinforced when, on the basis of experience, they adopted leadership roles, granted those roles to colleagues and were actively involved in school development in the presence of inquiry-based work methods.

Finally, regarding teachers' background characteristics, we expected distributed leadership and the teachers' level of education to be related since teachers' expertise has an important role in the strategy of leadership distribution. However, this relationship was not found. Considering the teacher's level of education, both bachelor's and master's degrees directly and positively seemed to strengthen teachers' inquiry-based working but did not affect their adoption of distributed leadership roles. Unexpectedly, age directly and positively affected distributed leadership with a medium effect. With increasing age, teachers tended to adopt leadership roles to a stronger extent. Furthermore, with increasing age, teachers tended to collaborate more and the motivational aspects appeared to be stronger. In addition, a positive relation was found between years of teaching experience, age and distributed leadership.

***Study 3: Teachers' and their school leader's perceptions of the relationships in distributed leadership, inquiry-based working, and realizing educational change in Dutch primary education (Chapter 4)***

This study aimed to gain in-depth illustrations of how teachers perceive the relationships between distributed leadership, inquiry-based working and the realization of change by focusing on the underlying processes and teachers' and principals' beliefs in their day-to-day practices. We explored whether the relationships were meaningful in their daily practices. To this end, a case study was performed in one school. The teachers who worked in this school scored high on the questionnaire, and the high scores were confirmed by the school leader. We

assumed that in such a school inquiry-based working in a context of distributed leadership would be strongly represented. Semi-structured interviews were conducted with the school leader and 11 teachers.

It appears that teachers have a need to learn from data, which they find crucial to their teaching. They strongly relate their willingness to improve their teaching by working inquiry-based. On the one hand, working inquiry-based generates arguments about what needs to be improved and why. On the other hand, inquiry-based work strengthens teachers to take initiatives and responsibility regarding educational improvement at the school level, since the arguments make them feel secure to step forward. The teachers underpinned the relationships we found in our previous study. It seemed self-evident to them that their day-to-day work encompasses teacher leadership involvement and inquiry-based work since change is part of their daily teaching practices. Both working inquiry-based and teacher leadership involvement seemed to be essential with regard to their commitment to school goals and educational development and appeared to strengthen their sense of professional efficacy and job satisfaction.

The school leader's and teachers' perceptions regarding inquiry-based working, distributed leadership and their relationships to realizing educational change in general are similar. Understandably, their focus is different because of the different responsibilities of their positions in the school. The teachers mostly refer to their classrooms, students' needs and their essential needs to take initiatives and use their expertise. The principal's focus instead highlights educational developments at the school level and, therefore, the necessity of a committed team. She encourages teachers to engage in inquiry-based working and take initiatives and responsibility. Further, an open, transparent, trustful and respectful school climate is crucial to all team members in taking initiative, working inquiry-based, collaborating and realizing change.

***Study 4: The relationships between primary school leaders' utilization of distributed leadership and teachers' capacity to change (Chapter 5)***

In this study, first, we wondered how primary school leaders perceive and apply the distributed leadership perspective in their school. Second, we investigated which aspects of teachers' capacity to change are more present in schools wherein principals apply a distributed leadership perspective than in schools without such a perspective. The questionnaire data of 787 Dutch primary school teachers and the interview data of the 58 principals of the participating schools were combined in a parallel mixed methods design.

Of the 58 school leaders, 33 recognized distributed leadership as a way of working in their schools. Herein, strategic, pragmatic and formal ways of distribution could

be distinguished. Their interpretations varied from granting teachers unlimited space and embracing the decisions teachers make, to principals delegating tasks since they found their job too comprehensive for one person, to an organizational structure of sub-teams working on organizational or educational related subjects. Of the other 25 principals, 5 of them partly distributed leadership as the teachers participated in decision-making processes at the school level, but they did not recognize taking initiative by teachers. Sixteen principals did not apply the distributed leadership perspective. Their arguments varied from having less experience to being the formal and final responsible leader in the school.

Notwithstanding the variations in principals' perceptions, teachers' extent of joint work, collegial support, sharing knowledge and experience appeared to be more present in schools where the principals applied distributed leadership than in schools without such a leadership perspective. In addition, teachers' internalization of school goals into personal aims and their sense of self-efficacy seemed to be more present. However, no relationships were found between distributed leadership in the school and teachers' task interdependency, the extent to which teachers stay current, experiment and reflect or their sense of job satisfaction.

### **Overall conclusion**

As stated in the introduction, the aim of this dissertation was to explore and provide insights into how inquiry-based working and distributed leadership are related to teachers' capacity to change. We found a strong and positive relationship between distributed leadership and inquiry-based working regarding teachers' capacity to change, as well as a positive mediating role of inquiry-based work. This means that when teachers are able to initiate and respond to educational changes based on their expertise and adopt an inquiry-based way of working, this ability seems to be related positively to their tendency to collaborate and participate in professional learning activities. Also, their sense of self-efficacy, job satisfaction and the likelihood of internalizing school goals appeared to be strongly reinforced. The relationships we found were explained by the teachers and the principal who participated in the case study. They perceived both inquiry-based working and leadership distribution to be meaningful and, moreover, crucial in their day-to-day practices. Inquiry-based working and using data illustrated which educational changes should be made in order to meet their students' needs and also encouraged them to use their expertise and take leadership roles. An open, transparent school climate was in their perception conditional for both inquiry-based working and leadership distribution. Within inquiry-based working, the most important driver appeared to be working with an inquiry habit of mind. A strong inquiry habit of mind relates to teachers' inclination to collaborate and obtain a high level of professional learning and can reinforce teachers' self-efficacy. Data use at the school level and in classrooms was



found to be complementary. This means that data use at these two levels seems to be related positively to fostering teachers' capacity to change.

Schools face the need to change and develop for many reasons, such as new technical and digital possibilities, different meanings of knowledge and learning and changing student populations (Biesta et al., 2015; Pllana, 2019; Priestley, 2011; Thomson et al., 2009). Also, changing teachers' practices is difficult (e.g., Commissie Parlementair Onderzoek Onderwijsvernieuwingen, 2008; Stoll, 2009; Van Veen et al., in press), but may refer to processes of organizational learning including cooperation and constructing new knowledge. Therefore, it is of interest that such ways of inquiry-based work and leadership distribution appear to contribute to teachers' commitment and contributions to educational change due to their collective nature and the strong collaboration these constructs both require.

Further, in line with the research of Harris and DeFlaminis (2016) and MacBeath (2005) among others, variations in school leaders' interpretations of distributed leadership were found. Nonetheless, such school leaders' variations in interpretations of distributed leadership do not seem to be a hindering factor since working in a school environment wherein leadership is distributed may still be worthwhile for teachers and school leaders in realizing educational change. Despite the variations in interpretations, such leadership distribution appears to be related positively to the extent to which teachers collaborate, share knowledge and experiences, and internalize school goals into personal aims as well as to their sense of self-efficacy. Those aspects of teachers realizing educational change seem to be more present in schools where principals apply distributed leadership than in schools without such leadership distribution.

### **General discussion**

The findings showed that it seems valuable, first, to encourage teachers individually and teams collectively to work inquiry-based as this may be related to teachers' collaboration and, second, to create a working environment wherein leadership distribution is common. The extent to which teachers may undertake professional learning activities as well as their sense of self-efficacy and the degree to which they internalize school goals appear to be related positively to such a working environment. Such aspects of teachers' change capacity are connected to realizing educational change based on a strong commitment. Since we used the inquiry-based way of working instead of data use, the findings expand Park and Datnow's research (2009) that demonstrated a relationship between collective decision-making and data use. In the case study, the teachers explained how such ways of working, including the mediating role of inquiry-based working, are relevant in their day-to-day teaching practices focused on better meeting students' needs. The teachers stated that the data analyses supplement their existing knowledge

and offer new information and arguments to improve. Teachers felt encouraged to take such initiatives and adopt a leadership role since they felt more secure. Herein, we follow prior research stating that inquiry-based working exceeds data use (Krüger, 2010b; 2018) and distributed leadership exceeds collective decision-making (Spillane, 2012a; Harris, 2014). In this line, we argue that principals may formally and informally distribute leadership roles in their teams and encourage teachers to work inquiry-based and take initiatives and responsibility by using their expertise, as educational change can be realized by a committed team.

Data use at the two different levels—in classrooms and at the school level—appeared to be a complementary factor, and as such, is essential at both levels. The classroom data use was related positively to individual teacher aspects such as a sense of self-efficacy, task interdependency, learning through experimenting, reflecting and internalizing school goals; the school-level data use was connected to teachers' likelihood of working jointly and sharing their knowledge and experiences. Data use at the school level relates to teamwork, while data use in the classroom is based on teachers' individual actions. Here, with regard to the complementary factors of using data individually and collectively, our findings support research of Hargreaves and Fullan (2012) and Ho and Lee (2016), as they indicated that in realizing educational change, collaboration is essential.

In general, with respect to inquiry-based working and distributed leadership, teachers' background characteristics were barely related. However, due to the composition of the response group and the case study in one school, this finding needs to be interpreted with care. Nevertheless, the question may raise why in some schools working inquiry-based and leadership distribution are common and why in other schools such ways of working are less common. With regard to distributed leadership, an explanation may be found in the school leaders' interpretations of the construct. As described in chapter 5, we found a variation in perceptions, which was in line with findings of Tian et al. (2016) and Harris and DeFlaminis (2016), as they stated that a collective sense of meaning from distributed leadership is missing.

Another explanation can be found in the different starting points of teachers and principals as described in the case study results. Whereas the principals, again, appear to be of all-importance in realizing change collectively at the school level, the teachers' viewpoint seems to start with a focus on their classrooms. They cited a natural need for room to take initiatives and to use their expertise since they want to realize the best for their students. To that end, data use, their natural curiosity and inquiry habit of mind were supportive of taking leadership roles and, therefore, essential to teachers realizing the best for their students. The principal's viewpoint started with her quest for a committed team. Therefore, she encouraged her teachers to be involved in decision-making processes and educational

development at the school level. In such processes, she urged teachers to share their expertise and knowledge within the team and work inquiry-based, focused on reinforcing their commitment. The principal's focus was on her responsibility to realize improvements at the school level and reflected her role as formal leader, whereas the teachers' focus expressed their responsibility to teach and meet students' needs in their classrooms.

Overall, the findings, first, argue for the idea that shared meanings and vision of the principal and the teachers with regard to inquiry-based working, data use and leadership distribution is of importance. As such, those constructs can be discussed in team meetings. Discussing leadership involvement and working inquiry-based appear to be positive related to teachers' well-being on the one hand and educational development at the school level on the other hand (e.g., Heikka et al., 2019; Wilcox & Lawson, 2018). Second, with respect to encouraging teachers to work inquiry-based, distributing leadership roles and realizing educational change, the principal's ability to share perceptions of those constructs and an open mind in terms of teachers' expertise, involvement and commitment are essential. This finding is in line with research of Harris (2014), Spillane et al. (2007), and Szeto and Cheng (2018) among others, as they pointed out that principals need to be able to shift to leadership perspectives other than their current perspective and need to trust their own and their teachers' expertise.

In the interviews (Chapter 4), the teachers emphasized the importance of an open, transparent and trustful school climate. They related such a climate to distributed leadership and to inquiry-based working and data use. Adopting and granting leadership roles and sharing findings from data use require feelings of being trusted. Such processes will not succeed in a school climate wherein teachers feel insecure or unsafe. Thus, creating such an open and safe climate by all team members is crucial. Fink (2016) pointed out that principals' and colleagues' trust is connected with teacher and school performance. If teachers feel appreciated, they may feel more comfortable in stepping forward, exploring and taking initiative.

This study offers a picture of teachers' perceptions of distributed leadership and inquiry-based working in their schools and the perceived capacity to realize educational change. To obtain this picture, we followed previous research (e.g., Aldaihani, 2019; Buske, 2018; Geijsel et al., 2009; Johnson & Voelkel, 2019; Kruger, 2010b; Uiterwijk-Luijk et al., 2017). We want to accentuate that the findings in this dissertation cannot provide incontrovertible evidence of causation due to the correlational nature of our research, although the outcomes of the qualitative study seem to indicate certain causation.

Furthermore, in our quantitative analysis in chapter 3, both directions in how

inquiry-based working and distributed leadership might be related were tested and the model wherein inquiry-based working mediated distributed leadership had a better fit. In teachers' and school leaders' perceptions and day-to-day-practice the relationship might be the other way around. This other way around relationship was not investigated, and as such, may be part of future research. Nevertheless, what can be concluded is that to work with an inquiry habit of mind, demonstrate data literacy, and use data individually and collectively and to be actively involved in leadership activities appear to be positive related to teachers realizing educational changes.

### **Contributions of this dissertation**

We are aware that the context of this research is the context of Dutch primary schools. As described before, compared with education systems in other countries, primary schools in the Netherlands operate in a highly autonomous policy context (OECD, 2018; Neeleman, 2019). This autonomy is reflected in schools' policies on pedagogical, personnel, and financial management. Schools are free to choose and follow their own pedagogical visions, based on different religious, ideological, or educational convictions (Hooge, 2017). They have the *“right of self-government—encompassing the freedom to make independent decisions—on the responsibilities that are decentralized to schools”* (Neeleman, 2019, p.4). Furthermore, the Netherlands does not have a national curriculum, rather a standardized framework with indicators included. Curricula are shaped by individual schools based on the standardized framework, though quality standards do apply to all schools. Finally, almost all schools are considered to have a good quality and almost all teachers are qualified. Comparing this context with for instance the American educational context (Cohen et al., 2018) shows that educational policy, schools, and teachers are perceived and understood in fundamental different ways. Though the exact implications of those differences for our conclusions are perhaps too complicated to articulate in this dissertation, it is relevant to note that the main conclusions of this research concerning inquiry-based working, distributed leadership and teachers' capacity to change are partially colored by the typical Dutch educational context.

Against this background, and despite the limitations described underneath, this dissertation contributes to the existing research firstly by focusing on the inquiry-based working approach rather than on the results-oriented approach, wherein schools' accountability is leading (Lai & Schildkamp, 2013). In both approaches, data are used. However, in the inquiry-based work approach, the data use has a broader perspective since the focus is on broad educational development—cognitive, social, emotional, and artistic—to better meet students' needs (Krüger, 2010a; 2018; Schildkamp, 2019). As such, inquiry-based working schools use various types of data paying attention to student's cognitive, personal and emotional needs. Such

a way of working requires professionals who work with an inquiry habit of mind, are data literate and use data individually and collectively (Earl & Katz, 2006; Mandinach & Schildkamp, 2020; Uiterwijk-Luijk et al., 2017). Due to the worldwide emphasis on students' results (e.g., in the Program for International Student Assessment [PISA], a triennial report on the state of education around the globe (Schleicher, 2018), and the Trends in International Mathematics and Science Study [TIMSS] conducted every four years since 1995), research on data use is available (Jimerson, 2014; Katz & Dack, 2014; OECD, 2018; Schildkamp et al., 2012; Schildkamp et al., 2019; TIMSS, 2019). However, less research is available that focuses on data use for educational development to better meet students' needs, which is the focus in inquiry-based working.

Second, this dissertation contributes to the existing research on distributed leadership. Many international studies emphasize the importance of distributed leadership (e.g., Bagwell, 2019; Bush & Glover, 2012; Diamond & Spillane, 2016; Harris, 2014; Spillane, 2012a; Spillane & Healey, 2010; Woods, 2016). In addition, school teams and principals are increasingly interested in the concept of leadership distribution. In our study, we investigated the direct and indirect effects of distributed leadership on teachers' capacity to change. We connected leadership distribution to the needs of schools to change, improve or adapt teaching strategies and realize educational change. Our findings connect to research of Klar et al. (2016), who stated that change may be better incorporated when principals inspire teachers to be involved in leadership as such inspiration ensures their commitment to change. In our study, we found that distributed leadership appears to be related positively to teachers' collaboration, commitment regarding school goals and realizing educational change, and their sense of self-efficacy.

Third, this dissertation contributes to the existing literature with research that increases the insights into how inquiry-based working, distributed leadership, and teachers' capacity to change can be related. Our findings described in chapters 3 and 4 revealed that besides a strong and positive relationship, inquiry-based working also has a mediating role. In a qualitative sense, the teachers and the principal in our case study confirmed this finding. They explained the mediating role as making sense of their experiences that realizing educational change is a challenge they face daily wherein inquiry-based working offers information about which changes must be made for the sake of their students' learning. In those processes, teachers need the ability to take initiative and use their expertise since they are professionals who give their students their best efforts. Their expertise is strengthened by the data, which makes them feel more secure in taking initiatives and realizing educational change, for such initiatives are based on facts and arguments rather than on their intuition. The qualitative study, described in chapter 4, revealed that teachers emphatically need a sense of freedom to take initiative and use their expertise and that the principal plays

an important role in creating such a working environment. The teachers emphasized the importance of a climate of trust and respect, which aligns with the findings of Fink (2016). All team members, including the principal, are responsible in creating such a school climate, for feelings of being trusted are crucial.

Fourth, our findings described in chapter 5 offer new insights into how various interpretations of distributed leadership are applied by school leaders and whether and how those different interpretations are related to aspects of teachers' change capacity. Previous research of MacBeath (2005) and Harris and DeFlaminis (2016) indicated that distributed leadership is interpreted in various ways. In our study, indeed, we found differences in school leaders' interpretations of distributed leadership, which corroborated those findings. Additionally, our study shows that despite those different interpretations, the extent to which teachers work jointly and support one another collegially is more present in schools where principals apply a form of distributed leadership than in schools without such a leadership perspective. Moreover, the extent to which teachers share their knowledge and experience and internalize school goals into personal aims as well as their sense of self-efficacy appear to be stronger in schools wherein the distributed leadership perspective is applied. Apparently, since no blueprint of the distributed leadership perspective is available (Tian et al., 2016), this might be an opportunity rather than a hindrance. It seems to be more important that principals create a framework of leadership distribution and distribute leadership themselves rather than have a clear description of the construct. Although, on the other hand, such a clear description coming from team discussions may encourage principals to relinquish control and distribute leadership further.

### **Limitations and directions for further research**

Four limitations, specifically with regard to the methodologies used, should be carefully considered when interpreting the results and conclusions.

First, with respect to the questionnaire results and the interviews, the notions of teachers and school leaders themselves considering their inquiry-based work, leadership distribution and aspects of change capacity were central to this thesis. Self-reports, by which participants' own perceptions are reflected, were used. This might be a limitation, since some participants tend to give socially desirable responses (e.g., Batista-Foguet, Revilla, Saris, Boyatzis, & Servalós, 2014; Schwartz, 1999). Social desirability can be regarded as a distortion in responses in a socially desirable direction. It can be interpreted as a result of 'self-deception' and 'other-deception' (Nederhof, 1985). Further, as the findings are based on self-reports, it may be plausible that the constructs measured correlate stronger than could be found when examined by using other measures than self-reports. Finally, social desirability can colour the validity of survey findings (Nederhof, 1985, Batista-

Foguet et al., 2014; Schwartz, 1999), specifically when the participants' scores on the questionnaire are relatively high. In our study, this was the case. Although we performed complementary qualitative research and, as such, contributed to more insights into teachers' actual inquiry-based working, this was limited to one case study. Therefore, a larger qualitative study in more schools and with more in-depth teacher interviews could gain even more insights into the constructs and their relationships, specifically in teachers' day-to-day practices.

Second, neither in the teachers' questionnaire nor in the principals' interviews school characteristics were considered, although, for instance, an open and safe school climate appears to be crucial for teachers to take initiatives and responsibility, share knowledge and experience, collectively analyze and interpret data, support colleagues and offer and receive feedback. In addition, the way school leaders gave meaning to their school context, including school and team characteristics, was not considered. However, how the work of teachers is organized is crucial for working in this way (Van Driel, Meirink, Van Veen, & Zwart, 2012) and the principal's understanding of the context is important (Leithwood et al., 2010). Moreover, other factors, such as present-day contextual problems, perceived workload pressures and schools' own patterns of authority, rules and procedures, might play a role in creating a school climate wherein leadership distribution and inquiry-based work are commonly accepted (Imants & Van Veen, 2010; Yeigh et al., 2019). Therefore, we recommend follow-up research to include information about the principal's sensitivity to the school's context as well as school characteristics regarding trust and openness in the team.

A third limitation also relates to the teachers' questionnaire. As the teachers all completed the same questionnaire, all variables were measured with the same instrument only once. It may be preferable to judge the influence of leadership distribution over time (Day et al., 2016). Here, supplementary to the above-mentioned suggestions, longitudinal research is recommended to further investigate which factors contribute—and how specifically—to the relationships between distributed leadership, inquiry-based work and teachers' change capacity. In such longitudinal research, a large sample size is desirable, and team members, including the principal, should be questioned about the underlying conditions, structures, traditions, expectations and norms that encourage the framework of teachers' leadership involvement and inquiry-based teamwork.

Finally, teachers' capacity to change was measured in an indirect way, resulting in indications of teachers' capacity to change, and not in teachers' actual capacity. This indirect way of measuring should be incorporated. Because of the focus on inquiry-based working and distributed leadership within the participating schools, measuring teachers' capacity to change directly was not really possible because

the teachers between and within schools differed in the changes they adapted or initiated. It would have been possible to ask for their self-perceptions of their change capacity, but that seemed rather limited. In future research, schools working on similar educational changes could be selected, allowing for a more direct way of measuring teachers' capacity to change.

### **Implications for practice and policy**

Several implications can be drawn from this study on four levels: (a) for teachers, (b) for school leaders, (c) for teacher and school leader educators, and (d) for policy makers.

#### ***Implications for teachers***

From a practical perspective, our findings are directly relevant for teachers, as for the capacity to change it appears to be worthwhile to work inquiry-based, use data individually at the level of the classrooms and collectively at the school level and to employ an inquiry habit of mind. When teachers adopt the inquiry-based way of working, they can create insight in which teaching methods suit and which do not. As such, they can better anticipate on their students' needs and contribute to educational development in their school by working jointly. Specifically, if they use their natural inquiry habit of mind, they tend to collaborate and are inclined toward new educational insights and teaching strategies. Also, they seem to experience a stronger sense of professional efficacy. Working inquiry-based can be supportive in taking initiatives and responsibility, by which teachers may feel encouraged to take a leadership role. Besides, as inquiry-based working generates arguments about what need to be improved, why and how, teachers may feel more secure in stepping forward and respecting one another's expertise. Stepping forward requires courage. But if teachers can trust their colleagues and principal, this may lead to a comfortable working climate wherein everyone is heard and respected for their expertise, even if not all the input can be acknowledged.

#### ***Implications for school leaders***

Our findings are directly relevant for school leaders, as the principals' role is essential in facilitating and encouraging teachers to make use of their inquiry habit of mind—being the most relevant aspect in inquiry-based working—and their expertise. Herein, principals specifically can heed expert teachers who may experience more comfort in their role and confidence in their abilities and who, therefore, may be more interested in learning about effective teaching (Day et al., 2016). Further, in considering leadership distribution to realize educational change, principals' ability to shift to new perspectives and to trust in teachers' expertise is relevant (Harris, 2014; Klar et al., 2016). Then, they can create a team climate of trust, respect and confidence. But they also may trust their own capabilities and dare to grant room rather than think in terms of control.



***Implications for teacher and school leader educators***

Educators can instruct student teachers and new school leaders, respectively, in how to work inquiry-based. Furthermore, since data use in the classroom and data use at the school level appear to be complementary, student teachers and future school leaders might be taught which data in schools are available and how data can be analyzed and interpreted in order to base decisions on data and evidence. Thereby, the importance of collectively making sense of new ideas and knowledge to find answers to educational and instructional issues seems to be worthwhile to learn (Little, 1982; 2012; Mandinach & Schildkamp, 2020; Schildkamp et al., 2019).

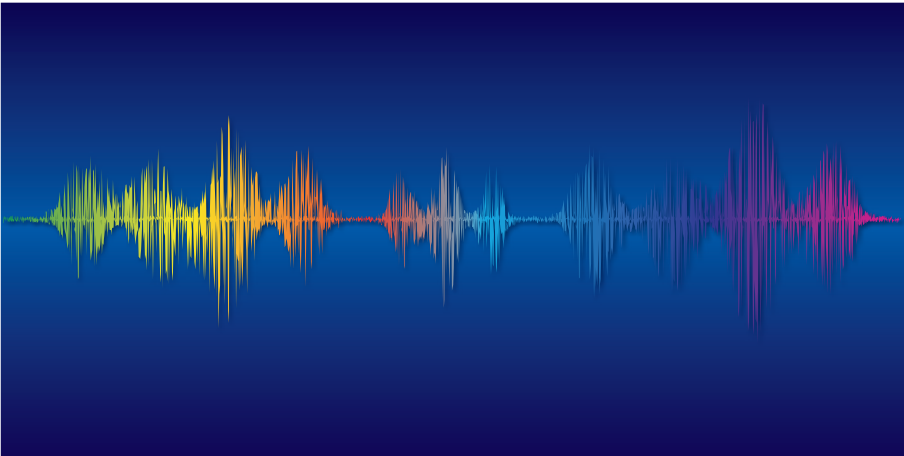
Further, the construct of distributed leadership can be discussed in school leadership courses to create in principals a sense of agency regarding this construct. Discussing the construct may support principals' courage to forgo the need of maximum control. A principal's attitude less based on control is essential in granting room to teachers to take initiatives and responsibility (Fullan, 2006; Pineda-Báez et al., 2019).

***Implications for policy makers***

Considering the risk-based approach in data use, which is an approach used in many countries, the results of our studies illustrated that a framework of distributed leadership wherein inquiry-based working is common can positively be related to teachers' capacity to change. As such, autonomy seems to be helpful for schools as they are free to make their own choices in adaptation and change. Governments and policy makers can grant autonomy to schools. Student populations may differ per school, city, region and country, and schools need a certain degree of autonomy and trust, as they know best their own students' population and needs. Additionally, governments' and national inspectorates' confidence in schools' capabilities to realize necessary educational growth and change is crucial (Fullan, 2006). However, autonomy is not just granted; it also needs to be adopted. Then, schools are able to use child-centered teaching approaches and make their own substantial educational choices to meet the different needs of their students, which may be the most important reason for teaching.

Overall, the findings of this dissertation show that for school leaders and teachers, it is worth the effort of listening to the silence whilst working on school development and realizing change, which is part of the music in schools. Then, by working inquiry-based and making use of data, colleagues will step forward, and take leadership roles by feeling comfortable and secure.





# **NEDERLANDSE SAMENVATTING**

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HET VERMOGEN VAN LERAREN OM  
ONDERWIJSKUNDIGE VERANDERINGEN  
TE REALISEREN DOOR ONDERZOEKSMATIG  
WERKEN EN GESPREID LEIDERSCHAP

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Das Geheimnis liegt in der Stille (Chailly, 2015).

## Inleiding

Het geheim ligt in de stilte (Chailly, 2015). In de muziek grenst de stilte niet slechts aan het begin of eind van een muziekstuk of uitvoering. Stilte is deel van het geheel, net als de noten. Stilte klinkt tussen de muziek door en is onmisbaar om de muziek als mooi te ervaren. Het zijn juist de stiltes gedurende het muziekstuk die de gelegenheid geven tot genieten, overdenken, afwachten en verwachten. Waar we in het onderwijs als leraren en schoolleiders vaak druk en voortdurend in actie zijn, zou het behulpzaam kunnen zijn om meer de stilte te zoeken en die te benutten. Stilte ontstaat tussen mensen en in onszelf. Stilte is te vinden in feiten en gegevens waar een luisterend oor nodig is om te horen (en te interpreteren) wat die feiten zeggen. Stilte leidt wellicht tot kansen voor anderen.

Besturen, schoolleiders en teams in het primair onderwijs werken continue aan het ontwikkelen en verbeteren van het onderwijs. Een focus op onderwijsontwikkeling betekent een focus op het veranderen van de onderwijspraktijk van leraren, zowel in de klas als op schoolniveau. Van teams wordt gevraagd dat zij kunnen omgaan met een dynamische omgeving, met veranderende doelen en veranderende kennis (Krüger, 2018). Dat vraagt van leraren een zeker verandervermogen, om de benodigde veranderingen te initiëren, implementeren en eigen te maken (Hopkins et al., 2014). Onderzoeksmatig werken, het werken vanuit een onderzoekende houding en gebruik van data (feiten en gegevens) in de klas en op schoolniveau, draagt bij aan de kwaliteit van onderwijs (Earl & Katz, 2006; Katz & Dack, 2014; Krüger, 2010a; 2010b). En onderzoeksmatig werken vraagt om leiderschap dat deze manier van werken aanmoedigt en faciliteert (Uiterwijk-Luijk et al., 2017). Het doel van het onderzoek dat wordt beschreven in dit proefschrift is om inzicht te verkrijgen in hoe onderzoeksmatig werken en gespreid leiderschap gerelateerd zijn aan het verandervermogen van leraren.

Basisscholen staan voor uitdagingen zoals het omgaan met nieuwe digitale mogelijkheden, een veranderende leerling populatie, religieuze en culturele diversiteit, de nadruk op het gebruik van data in een opbrengstgerichte omgeving, het aanleren van 21<sup>e</sup>-eeuwse vaardigheden en passend onderwijs (e.g., Biesta et al., 2015; Pllana, 2019; Priestley, 2011; Schuman, 2013; Thomson et al., 2009). Het veranderen van de onderwijspraktijk is een veel vragend en moeilijk proces (e.g., Commissie Parlementair Onderzoek Onderwijsvernieuwingen, 2008; Stoll, 2009; Van Veen et al., in press), dat lijkt samen te hangen met processen van organisatieleren waarin aandacht is voor samenwerken en het gezamenlijk creëren van nieuwe kennis. Dit betekent dat het omgaan met genoemde uitdagingen van leraren vraagt dat zij het onderwijs dat zij verzorgen kunnen aanpassen en dat zij open staan voor individueel en collectief leren en samenwerken met collega's (e.g., Geijssels et al., 2009; Richardson en Placier, 2001; Slegers en Leithwood, 2010; Stoll, 2009, 2013;

Van Veen et al., in press). Richardson en Placier (2001) onderscheiden in het realiseren van onderwijskundige veranderingen twee benaderingen: veranderen vanuit het externe perspectief (implementatie van veranderingen die extern zijn geïnitieerd) of vanuit het interne perspectief (het vermogen van scholen om zelf te transformeren tot een organisatie waarin leraren leren). Het interne perspectief hanteert de aanname dat er een relatie is met organisatieleren, dat kan worden gedefinieerd als activiteiten waarin leden nieuwe kennis construeren of bestaande kennis reconstrueren met het doel het functioneren van zowel de individuele leden als de organisatie als geheel te verbeteren (Leithwood, Aitken, & Jantzi, 2001). Individueel leren is nodig maar niet voldoende; collectief, als gehele organisatie leren ontstaat door samenwerken en het delen van kennis en ervaring (Little, 1990) en is eveneens van belang voor het verbeteren van de organisatie. Samenwerken draagt bij aan het verbeteren van instructie door leraren en, uiteindelijk, tot betere leerlingresultaten (Vangrieken et al., 2015). In deze studie volgen we het interne perspectief van veranderen, waarbij we het realiseren van onderwijskundige veranderingen zien als een proces van collectieve betekenisgeving aan nieuwe situaties en het creëren of reconstrueren van kennis (Richardson & Placier, 2001). Doel hierbij is het individueel en collectief leren door leraren te versterken en gezamenlijk een onderwijspraktijk te realiseren die sterk georiënteerd is op de leerbehoeften van de leerlingen. De keuze voor het interne perspectief is gelegen in een aantal factoren en hangt mede samen met de context van het Nederlandse primair onderwijs waarin dit onderzoek is gedaan. Ten eerste zien leraren in het Nederlands primaire onderwijs zichzelf als professionals die sterk betrokken zijn op hun werk en hun leerlingen en opereren in een sterk autonome en kwalitatief hoogwaardige context (Van Veen, 2011). Ten tweede is er in de afgelopen jaren vanuit de overheid een aantal veranderingen top down doorgevoerd waarvan de implementatie en acceptatie niet altijd succesvol is verlopen (Commissie Parlementair Onderzoek Onderwijsvernieuwingen, 2008; Van Veen et al., in press). Ten derde, zoals eerder beschreven, zien leraren zich geplaagd voor forse uitdagingen in het realiseren van onderwijs dat blijft aansluiten bij veranderende omstandigheden.

In onze studie refereert onderzoeksmatig werken aan een dergelijk proces van organisatieleren, omdat onderzoeksmatig werken samenwerken en samen leren vraagt. De veronderstelling is dat er een relatie is tussen een dergelijk proces van organisatieleren en het vermogen van leraren dat nodig om onderwijskundige veranderingen te realiseren.

Daarbij: het bewerkstelligen en onderhouden van een organisatie waarin onderzoeksmatig wordt gewerkt en in gezamenlijkheid wordt geleerd, vraagt om coördinatie, facilitering en leiderschap. Het ontwikkelen van een brede leiderschapscapaciteit in de school heeft voortdurende aandacht nodig. Hierin volgen we onder andere Buske (2018), Harris (2014), Spillane (2012a; 2012b),

Seashore Louis (2016) en Diamond en Spillane (2016). Zij stellen dat het succes van onderwijskundige veranderingen mede afhangt van de mate waarin leraren initiatief en verantwoordelijkheid kunnen nemen, creatief kunnen zijn en hun expertise kunnen inzetten in de school met de focus op het realiseren van onderwijskundige veranderingen ten gunste van de organisatie, de leerlingen en de leraren zelf.

In de hiernavolgende paragrafen worden de begrippen vermogen van leraren om onderwijskundige veranderingen te realiseren, onderzoeksmatig werken en gespreid leiderschap toegelicht. De onderzoeksvragen en de resultaten van de deelstudies worden beschreven, waarna er conclusies en een discussie volgen. We eindigen met het beschrijven van praktische implicaties voor belanghebbenden als schoolleiders, leraren, opleiders in leraren- en schoolleidersopleidingen, besturen en overheden.

## **Kernconcepten**

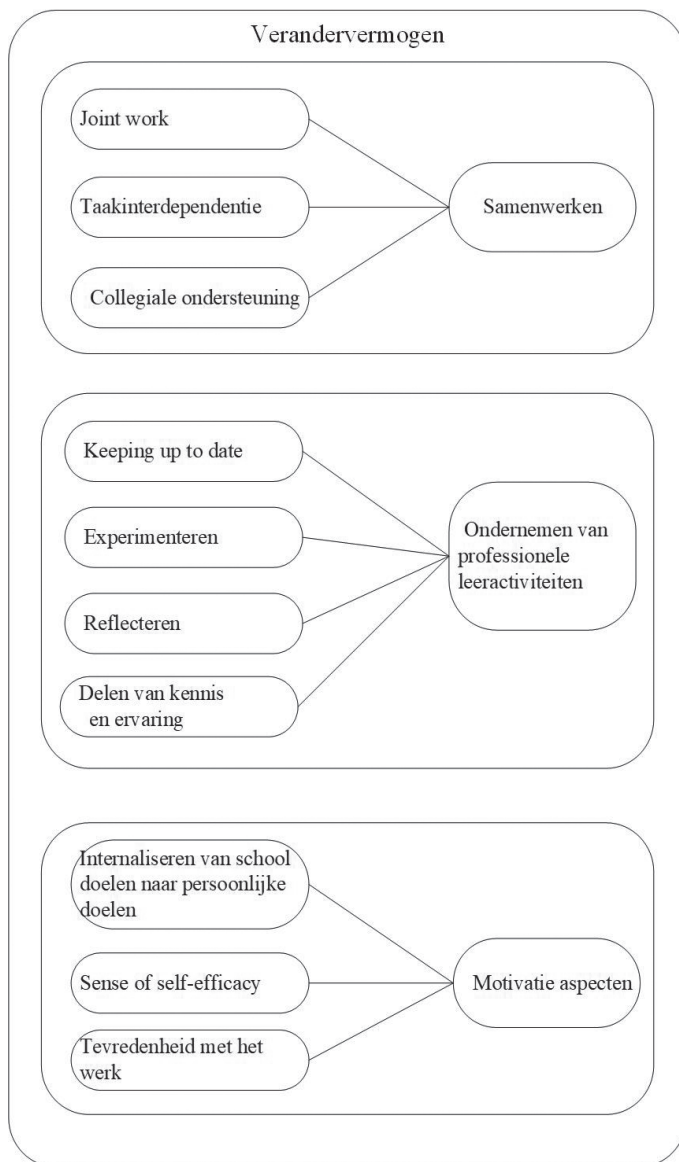
### ***Vermogen van leraren om onderwijskundige veranderingen te realiseren***

Geijsel et al. (2009) definiëren verandervermogen als het vermogen van leraren om veranderingen die worden geïnitieerd door de overheid, door het bestuur of door henzelf uit te werken en te implementeren in de eigen school (Geijsel et al., 2009). In deze studie hanteren we het intern perspectief van veranderen (Richardson & Placier, 2001), waarin de nadruk ligt op het initiëren en implementeren van veranderingen door teamleden zelf, passend bij hetgeen de organisatie nodig heeft in het bieden van kwalitatief goed onderwijs dat aansluit op de onderwijsbehoeften van de leerlingen. In directe zin was verandervermogen moeilijk te meten, omdat in de praktijk leraren per school en zelfs binnen een team kunnen verschillen ten aanzien van de veranderingen die zij initiëren en doorvoeren. Om die reden operationaliseren we het begrip verandervermogen in deze studie meer indirect door aspecten te onderzoeken die bijdragen aan, en derhalve een indicatie zijn voor het vermogen van leraren om onderwijskundige veranderingen te realiseren.

Gebaseerd op werk van Stoll (2009, 2013), Ho en Lee (2016), Geijssel et al. (1999), Geijssel et al. (2009), en Diseth et al. (2012) hebben we het verandervermogen van leraren geoperationaliseerd in de volgende aspecten (zie ook figuur 1):

1. Het interpersoonlijk aspect: samenwerking. In het concretiseren van samenwerking volgen we Little (1982) die samenwerken omschrijft als *joint work*: het gezamenlijk betrokken zijn bij het oplossen van problemen en bereiken van doelen door ervaringen, ideeën en werkwijzen uit te wisselen zodat er nieuwe lespraktijken worden gedeeld en gebruikt. Een hoge mate van wederzijdse afhankelijkheid en collegiale ondersteuning is eigen aan *joint work* (Thoonen et al., 2011).
2. Het organisatorisch aspect: de mate waarin leraren professionele leeractiviteiten ondernemen. In welke mate zorgen ze ervoor dat ze up-to-date blijven in de kennis nodig voor hun vak? Ook kijken we naar de mate waarin leraren experimenteren en reflecteren en hun kennis en ervaring delen. Hierin sluiten we aan bij eerder onderzoek van Geijssel et al. (2009) en Hargreaves & Fullan (2012).
3. Het persoonlijke aspect: motivatievariabelen als de mate waarin leraren schooldoelen internaliseren, hun gevoel van self-efficacy en de tevredenheid in hun werk. Leraren die de schooldoelen als eigen doelen hebben aangenomen, zijn betrokken bij hun school en participeren in leer- en veranderprocessen (Geijssel et al., 2009; Kapa & Gimbert, 2018). Self-efficacy wordt omschreven als het gevoel 'Ja, ik kan dat'. Leraren die dat gevoel hebben zijn volhardend in het vinden van oplossingen voor problemen vanuit het idee dat ze zich capabel voelen voor hun werk (Bandura, 1977). Tevredenheid in het werk wordt verkregen door het opdoen van positieve ervaringen in het werken als leraar en draagt bij aan commitment (Hulpia et al., 2009).





**Figuur 1.** Kernconcept Vermogen van leraren om onderwijskundige veranderingen te realiseren

### **Onderzoeksmatig werken**

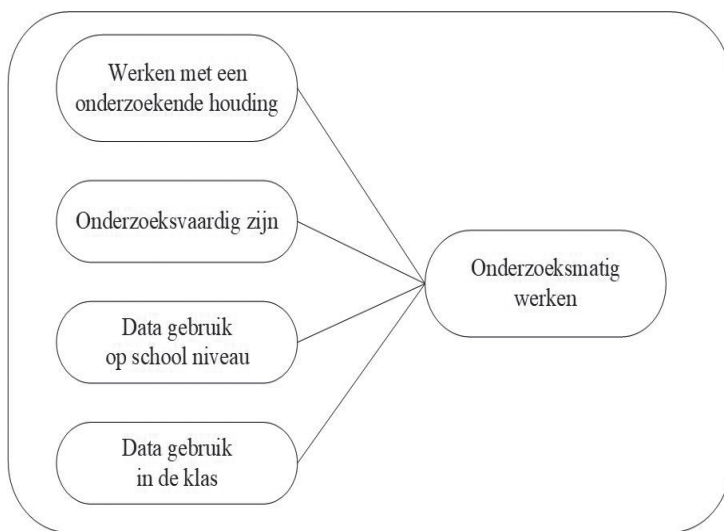
Onderzoeksmatig werken is om een aantal redenen van belang. In de eerste plaats omdat de samenleving in de afgelopen decennia is veranderd van een industriële samenleving naar een samenleving waarin kennis centraal staat. Dit vraagt van

leraren en leerlingen een onderzoekende houding waarmee zij kennis kritische kunnen beschouwen. Daarnaast vraagt veranderen om creativiteit en innovatie, waarbij gegevens het monitoren ondersteunen. Ook hebben scholen te maken met een verantwoordingsplicht die vraagt om het verzamelen van data (Krüger, 2014; Krüger, 2018). Hoewel de term data-gedreven besluitvorming vaak wordt gehanteerd (Ikemoto & Marsh, 2007; Lai & Schildkamp, 2013; Van Geel et al., 2016), gebruiken we in deze studie de term onderzoeksmatig werken, omdat daarin het ontwikkelingsperspectief het uitgangspunt is, hetgeen nodig is in het realiseren van onderwijskundige veranderingen.

Onderzoeksmatig werken wordt omschreven als het werken met een onderzoekende houding, het toepassen van onderzoeksvaardigheden en het gebruik van data in de klas en op schoolniveau (Earl & Katz, 2006; Krüger, 2014; Krüger, 2018; Uiterwijk-Luijk et al., 2017) (Zie figuur 2). Leraren die onderzoeksmatig werken zijn nieuwsgierig, stellen vragen, en kunnen op systematische wijze data verzamelen, analyseren en interpreteren. Op basis van de data en de analyses nemen leraren beslissingen en voeren ze acties uit die gericht zijn op het tegemoetkomen aan leerbehoeften van hun leerlingen (Marsh & Farell, 2015). Onderzoeksmatig werken omvat volgens bovenstaande omschrijving meer dan datagebruik en opbrengstgericht werken. Waar opbrengstgericht werken de nadruk legt op het versterken van de reken- en taalvaardigheden van leerlingen en werkt vanuit het perspectief van verantwoording, hanteren leraren die onderzoeksmatig werken het ontwikkelingsperspectief: zij hebben in het gebruiken van data een focus op het beter tegemoetkomen aan het onderwijs dat hun leerlingen nodig hebben (Krüger, 2014; 2018). Dit sluit aan bij onderzoek van Mandinach en Schildkamp (2020). Zij geven aan dat de primaire focus niet op de data zou moeten zijn, maar dat gestart zou moeten worden met het stellen van heldere doelen. De data maken deel uit van het proces dat leidt tot het realiseren van die doelen. Data omvatten dan zowel kwalitatieve data, bijvoorbeeld interviews of verslagen van observaties, als kwantitatieve data, waar toetsresultaten een voorbeeld van zijn. Daarnaast onderscheiden Marsh en Farell (2015) input data, bijvoorbeeld het niveau waarop leerlingen instromen, proces data, bijvoorbeeld data die laten zien welke ontwikkeling een leerling op een vakgebied heeft doorgemaakt, data die tevredenheid weergeven, bijvoorbeeld leerling- en oudertevredenheidsspeilingen, en output data zoals leerlingresultaten. In onderzoeksmatig werken wordt gebruik gemaakt van zowel intern als extern beschikbare data ('evidence-based'), die inzicht kunnen geven in effectieve onderwijs- en leerstrategieën die bijdragen aan het realiseren van benodigde veranderingen.

Verondersteld wordt dat leraren door onderzoekend te werken niet uitsluitend vertrouwen op verworven routines maar ook open staan voor nieuwe manieren van lesgeven en deze gezamenlijk ontwikkelen (Katz & Dack, 2014; Schildkamp et

al., 2019). Data laten zien welke veranderingen nodig zijn om tegemoet te kunnen blijven komen aan wat leerlingen nodig hebben. Zo kan onderzoeksmatig werken een belangrijke rol hebben in het realiseren van de veranderingen die in de school nodig zijn (Brown & Greany, 2018; Brown et al., 2017; Datnow & Hubbard, 2016; Krüger, 2010a).



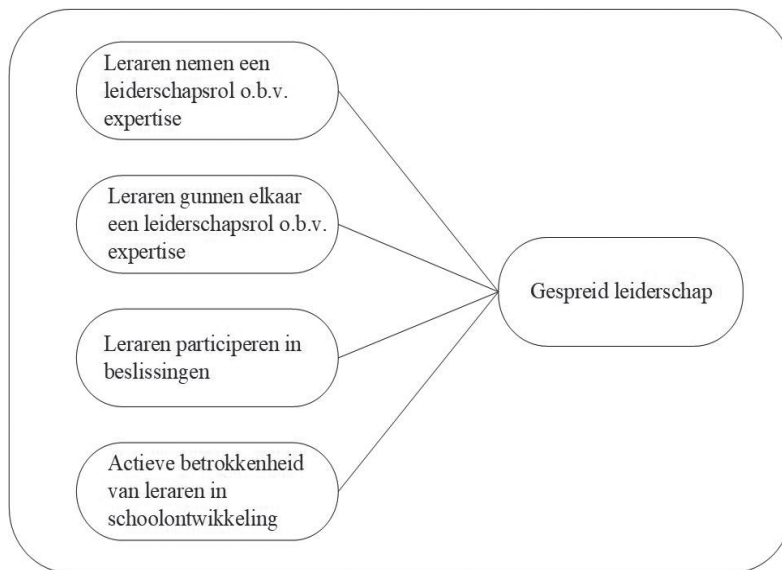
**Figuur 2.** Kernconcept Onderzoeksmatig werken

### ***Gespreid leiderschap***

Het realiseren van veranderingen in de school èn het creëren van een klimaat waarin onderzoeksmatig wordt gewerkt, vraagt om leiderschap (Buske, 2018; Diamond & Spillane, 2016). De mate waarin leraren autonoom kunnen handelen is van invloed op het succes van de veranderingen (DeMatthews, 2014). Zij willen bij kunnen dragen aan het realiseren van de benodigde veranderingen en zich daar eigenaar van voelen. In dit onderzoek wordt daarom het perspectief van gespreid leiderschap gebruikt. Gespreid leiderschap kent geen eenduidige definitie (Tian et al., 2016), al zijn er wel enkele kenmerken waarmee gespreid leiderschap zich onderscheidt van andere vormen van leiderschap. Volgens het perspectief van gespreid leiderschap kunnen de leden van de organisatie op basis van hun expertise een leiderschapsrol op zich nemen. Aanwezige kennis wordt benut, verantwoordelijkheid gedeeld en beslissingen aangaande onderwijsverandering worden gezamenlijk genomen. Degene in het team die het best is toegerust of over de beste vaardigheden beschikt om een bepaald doel te bereiken, kan daartoe initiatief nemen en een leiderschapsrol op zich nemen. Teamleden geven elkaar de ruimte om een dergelijke rol aan te nemen omdat ze de expertise erkennen (Binkhorst et al., 2018; Harris, 2014; Spillane, 2012a). Als het leraren wordt gegund

dat zij een leiderschapsrol op zich kunnen nemen, draagt dat bij aan hun gevoel van eigenaarschap, hun betrokkenheid en hun gevoel van *self-efficacy* (Bangs & Frost, 2016). Formeel en informeel leiderschap zijn beide aanwezig in gespreid leiderschap. Het informele leiderschap wisselt voortdurend omdat het samenhangt met de doelen die gerealiseerd gaan worden en de in het team aanwezige expertise. De schoolleider heeft een belangrijke rol in het spreiden van leiderschap. Enerzijds is de schoolleider degene die kan faciliteren en aanmoedigen; anderzijds vraagt gespreid leiderschap van de schoolleider een mind shift in het uitdragen van leiderschap en het delen van verantwoordelijkheid.

Gebaseerd op bovenstaande worden in dit onderzoek in gespreid leiderschap vier aspecten onderscheiden: (1) de mate waarin leraren op basis van hun expertise een leiderschapsrol op zich nemen, (2) de mate waarin leraren hun collega's op basis van erkende expertise gunnen dat zij een leiderschapsrol op zich kunnen nemen, (3) het gezamenlijk nemen van beslissingen aangaande onderwijsontwikkeling, en (4) de actieve betrokkenheid van leraren in schoolontwikkeling (Figuur 3).



**Figuur 3.** Kernconcept Gespreid leiderschap

Eerdere studies hebben laten zien dat een schoolomgeving waarin onderzoeksmatig werken en datagebruik een gangbare, geaccepteerde manier van werken is, bijdraagt aan het realiseren van onderwijskundige veranderingen (Earl & Katz, 2006; Fullan, 2006; Krüger, 2010; Krüger & Geijssel, 2011; Schildkamp et al., 2012; Uiterwijk-Luijk et al., 2019; Uiterwijk-Luijk et al., 2017). Volgens Fullan

(2006) zou niet het verantwoordingsperspectief centraal moeten staan maar het ontwikkelingsperspectief; de laatste draagt in belangrijker mate bij aan het succesvol realiseren van onderwijskundige veranderingen en het vergroten van het verandervermogen van leraren. Het creëren en onderhouden van een omgeving waarin onderzoeksmatig wordt gewerkt, vraagt om leiderschap, coördinatie en facilitering, en specifiek om leiderschap dat leraren in staat stelt zelf initiatieven tot veranderingen te nemen vanuit eigen expertise, waardoor zij zich eigenaar voelen van en betrokken zijn bij de veranderingen (Cranston, 2016; Spillane, 2012b). Dat zou betekenen dat onderzoeksmatig werken en gespreid leiderschap ieder bijdragen aan het succesvol realiseren van onderwijskundige veranderingen. Echter, onderzoek naar of en hoe onderzoeksmatig werken, gespreid leiderschap en het verandervermogen van leraren onderling met elkaar verbonden zijn, is schaars, evenals een diepgaander inzicht in de perceptie van leraren ten aanzien van deze begrippen en hun onderlinge verhouding in hun dagelijkse onderwijspraktijk. Het doel van deze dissertatie is om te onderzoeken en inzicht te verkrijgen in hoe onderzoeksmatig werken en gespreid leiderschap in relatie staan tot het verandervermogen van leraren.

### **Onderzoeksvragen**

De onderzoeksvragen in dit proefschrift luiden als volgt:

1. In welke mate heeft onderzoeksmatig werken impact op het verandervermogen van leraren?
2. Hoe beïnvloeden onderzoeksmatig werken en gespreid leiderschap het verandervermogen van leraren?
3. Hoe percipiëren leraren en hun schoolleider de relatie tussen onderzoeksmatig werken, gespreid leiderschap en het realiseren van onderwijs in hun dagelijkse onderwijspraktijk?
4. Hoe percipiëren schoolleiders gespreid leiderschap en hoe passen ze gespreid leiderschap in hun school toe? En welke aspecten van het verandervermogen van leraren zijn sterker aanwezig in scholen waar de schoolleider leiderschap spreidt dan in scholen waarin de schoolleider leiderschap niet spreidt?

### **Onderzoekscontext en onderzoeksontwerp**

Dit onderzoek is gesitueerd in de context van het Nederlandse primaire onderwijs. In het Nederlandse onderwijs is geen nationaal curriculum en hebben scholen een grote mate van autonomie (OECD, 2018; Neeleman, 2019). Deze autonomie wordt weerspiegeld in de vrijheid die scholen hebben om eigen beleid te voeren ten aanzien van bijvoorbeeld hun pedagogisch en didactisch handelen. Ook kunnen scholen en besturen een eigen financieel en personeelsbeleid voeren (Hooge, 2017). De Onderwijsinspectie dient de

onderwijskwaliteit van scholen te controleren en waarborgen en hanteert hiertoe een waarderingskader waarin de controle op eind- en toetsresultaten leidend is (Ehren et al., 2017). Scholen gebruiken data om zich te verantwoorden. Anderzijds biedt de grote mate van autonomie scholen de mogelijkheid om data te gebruiken ten behoeve van het ontwikkelen van hun onderwijs. Zo kunnen ze goed blijven aansluiten bij de onderwijsbehoeften van hun leerlingen.

Om inzicht te verkrijgen in hoe onderzoeksmatig werken en gespreid leiderschap gerelateerd zijn aan het verandervermogen van leraren zijn drie datasets gegenereerd. Een digitale vragenlijst is verspreid onder leraren van 65 scholen, verspreid over het land (beschreven in de hoofdstukken 2 en 3). De vragenlijst gaf een responspercentage van 79%. Opschonen van de data resulteerde in een responsgroep van 787 leraren van 61 scholen. De schoolleiders van de deelnemende scholen zijn telefonisch geïnterviewd (N =58). Daarnaast is op een van de scholen een casestudie uitgevoerd om te onderzoeken hoe leraren en hun schoolleider de relatie tussen onderzoeksmatig werken, gespreid leiderschap en het realiseren van veranderingen in de school percipiëren in hun dagelijkse praktijk (hoofdstuk 4).

Om de relatie tussen het al dan niet toepassen van gespreid leiderschap door de schoolleider en het verandervermogen van leraren te onderzoeken, combineerden we de resultaten van de telefonisch interviews met de uitkomsten van de vragenlijst (hoofdstuk 5).

## Samenvatting van de resultaten en conclusie

In **hoofdstuk 2** wordt een studie gepresenteerd naar de relatie tussen het onderzoeksmatig werken door leraren en hun verandervermogen. De onderzoeksvragen waren als volgt geformuleerd: (1) In welke mate heeft onderzoeksmatig werken impact op het verandervermogen van leraren? (2) Welk aspecten in onderzoeksmatig werken zijn de belangrijkste stuwende krachten op het verandervermogen van leraren? Alle vier gemeten aspecten van onderzoeksmatig werken - werken met een onderzoekende houding, onderzoeksvaardig zijn, het gebruik van data op schoolniveau en het gebruik in de klas - bleken het verandervermogen van leraren te versterken. De resultaten wijzen uit dat leraren die onderzoeksmatig werken meer geneigd zijn om samen te werken en professionele leeractiviteiten te ondernemen, en dat zij zich meer gemotiveerd voelen om schooldoelen te realiseren. De belangrijkste stuwende kracht hierin bleek het werken met een onderzoekende houding. Daarnaast bleek ook datagebruik op schoolniveau en in de klas van belang. Datagebruik op schoolniveau versterkte het internaliseren van schooldoelen tot persoonlijke doelen, *joint work* en het delen van kennis en ervaring, terwijl datagebruik in de

klas bij leraren het gevoel van taakinterdependentie en *self-efficacy* versterkte. Ook de mate waarin ze experimenteerden, reflecteerden en zich schooldoelen eigen maakten was bij deze leraren sterker aanwezig. Een relatie met tevredenheid in het werk werd niet gevonden.

Tevens werden enkele interacties tussen deelaspecten gevonden. Zo leken leraren die met een onderzoekende houding werkten en tevens onderzoeksvaardig waren minder geneigd deel te nemen in *joint work*. Ook leken deze leraren minder geneigd kennis en ervaring te delen in combinatie met het gebruik van data op schoolniveau.

In deze studie werd ook de rol van achtergrondkenmerken als sekse, leeftijd, het aantal jaren ervaring van leraren en hun behaalde onderwijsniveau (een bachelor of een masterdiploma) onderzocht. Van deze achtergronden bleek alleen het behaalde onderwijsniveau gerelateerd te zijn aan onderzoeksmatig werken: leraren die een masteropleiding hadden afgerond, bleken meer geneigd tot onderzoeksmatig werken dan leraren met een afgeronde bacheloropleiding. Echter, slechts 6% van de participanten had een afgeronde masteropleiding, hetgeen betekent dat dit resultaat met enige voorzichtigheid moet worden geïnterpreteerd.

In **hoofdstuk 3** wordt beschreven hoe onderzoeksmatig werken en gespreid leiderschap direct of indirect van in relatie staan tot het verandervermogen van leraren. De veronderstellingen in dit onderzoek waren dat (1) zowel onderzoeksmatig werken als gespreid leiderschap een positief direct effect hebben op het verandervermogen van leraren, en dat (2) onderzoeksmatig werken mediërend werkt op gespreid leiderschap waardoor het verandervermogen van leraren verder wordt versterkt. Modeltoetsing leidde tot vier belangrijke resultaten. Ten eerste bleek gespreid leiderschap een direct positieve samenhang te hebben met samenwerking en de motivatie aspecten en een indirect positieve samenhang met het ondernemen van professionele leeractiviteiten. Ten tweede bleek onderzoeksmatig werken een direct en positieve samenhang te hebben op alle aspecten van het verandervermogen van leraren. Ten derde bleek onderzoeksmatig werken in sterke en positieve mate via een mediërende rol gespreid leiderschap op alle deelaspecten van het verandervermogen van leraren verder te versterken. Dit betekent dat samenwerking, het ondernemen van professionele leeractiviteiten en de motivatie aspecten (het internaliseren van schooldoelen, *self-efficacy* en tevredenheid in het werk) sterker worden als leraren leiderschapsrollen op zich kunnen nemen en actief betrokken zijn bij school- en onderwijsontwikkeling in een omgeving waarin onderzoeksmatig wordt gewerkt. Tot slot werd een positieve relatie verwacht tussen gespreid leiderschap en het opleidingsniveau van leraren, aangezien expertise een belangrijk kenmerk is bij het spreiden van leiderschap. Deze relatie bleek niet aanwezig te zijn. De leeftijd van leraren en het aantal jaren

ervaring bleken echter wel een positief directe relatie te hebben met gespreid leiderschap. Naarmate leraren ouder waren of meer ervaring hadden, bleken ze meer geneigd een leiderschapsrol op zich te nemen.

In de volgende deelstudie, beschreven in **hoofdstuk 4**, is een casestudie uitgevoerd om te onderzoeken hoe leraren en hun schoolleider de relatie tussen onderzoeksmatig werken, gespreid leiderschap en het realiseren van onderwijs percipiëren in hun dagelijkse onderwijspraktijk. Uit de deelnemende scholen is een school geselecteerd die zowel hoog scoorde op alle deelaspecten in de vragenlijst, zijnde alle deelaspecten van onderzoeksmatig werken, gespreid leiderschap en het verandervermogen, en waarvan de schoolleider in het telefonisch interview benadrukte dat er in de school in sterke mate leiderschap wordt gespreid. Er vonden semigestructureerde interviews plaats onder 12 leraren. Zo werd meer inzicht verkregen in hoe leraren en hun schoolleider de in hoofdstuk 3 gevonden relaties herkennen en van belang achten in hun dagelijkse praktijk. De leraren gaven aan het essentieel te vinden om nieuwsgierig te kunnen zijn, om data te gebruiken en van data te leren. Zij relateerden het verbeteren van hun onderwijs sterk aan onderzoeksmatig werken. Enerzijds biedt onderzoeksmatig werken hen argumenten waarom en welke elementen in hun onderwijs verbetering behoeven, en anderzijds sterkt onderzoeksmatig werken hen in het nemen van initiatieven en verantwoordelijkheid. Onderzoeksmatig werken vergroot hun kennis, waardoor ze eerder een leiderschapsrol op zich durven te nemen. Daarnaast vonden de leraren het vanzelfsprekend dat ze ruimte krijgen om initiatieven te nemen en het onderwijs in de school verder te ontwikkelen omdat zij de experts zijn op het gebied van onderwijs geven en weten wat de leerlingen in hun groep nodig hebben. Zowel onderzoeksmatig kunnen werken als het actief betrokken kunnen zijn bij onderwijsontwikkeling waarin hun kennis wordt benut, waren voor hen essentieel voor het betrokken zijn bij de school, en voor hun gevoelens van *self-efficacy* en tevreden zijn in het werk.

De perceptie van de schoolleider was nagenoeg gelijk aan die van de leraren. Er bleek echter wel een verschil te zijn. Waar de schoolleider een sterke focus had op het creëren van betrokkenheid van de leraren bij de school om welke reden ze hen aanmoedigde om onderzoeksmatig te werken en leiderschap op zich te nemen, waren de leraren vooral gefocust op onderzoeksmatig werken en het nemen van initiatieven in relatie tot hun groep. Een dergelijk verschil is verklaarbaar vanuit de eindverantwoordelijkheid die de schoolleider heeft, terwijl leraren prioriteit geven aan de verantwoordelijkheid die ze hebben voor de leerlingen in hun groep. Ondanks dat, bleken de leraren het belang van samenwerken wel te zien: door samen data te gebruiken stellen ze elkaar kritische vragen, geven ze feedback op acties en verkrijgen ze gezamenlijk nieuwe inzichten. Zowel door de leraren als door de schoolleider werd het belang benadrukt van een open, transparant schoolklimaat.



Gerespecteerd, gewaardeerd en gezien worden lijkt voor teamleden cruciaal om onderzoeksmatig te kunnen werken, leiderschapsrollen aan te nemen en om samen te werken en kennis te delen. Vertrouwen bieden blijkt hierin een belangrijke factor.

In de vierde deelstudie, beschreven in **hoofdstuk 5**, is eerst onderzocht hoe schoolleiders gespreid leiderschap interpreteren. Daarna is onderzocht of en zo ja welke aspecten van het verandervermogen van leraren sterker aanwezig waren in scholen waarin schoolleiders aangaven gespreid leiderschap toe te passen dan in scholen waarin dat niet het geval was. Hiertoe zijn de resultaten van de telefonische interviews die met schoolleiders zijn gehouden gecombineerd met de resultaten van de vragenlijst die onder leraren was afgenomen.

Van de 58 geïnterviewde schoolleiders gaven er 33 aan dat zij gespreid leiderschap toepassen in hun school. Hun interpretaties varieerden van het toekennen van ongelimiteerde ruimte aan leraren om initiatieven te nemen tot het delegeren van taken; van een organisatiestructuur van werkgroepen waarin de schoolleider de voorzitter aanwijst en al dan niet een opdracht meegeeft tot leraren die op eigen initiatief en op basis van expertise een werkgroep starten omdat ze daartoe aanleiding vonden in doelen die niet werden behaald. Een gering aantal schoolleiders (n = 5) gaf aan dat leraren betrokken worden in het nemen van beslissingen en dat ze derhalve gespreid leiderschap hanteren. De schoolleiders die aangaven geen gespreid leiderschap toe te passen (n = 16) beargumenteerden dat vanuit de gedachte zelf te weinig ervaring te hebben of dat ze vanuit hun formele eindverantwoordelijke geen verantwoordelijkheid uit handen durfden of konden geven.

Ondanks deze variatie in interpretaties van gespreid leiderschap, bleek dat in scholen waarin schoolleiders zeggen gespreid leiderschap toe te passen leraren meer geneigd tot *joint work* en collegiale ondersteuning. Ook lijken ze in sterkere mate kennis te delen en schooldoelen te internaliseren. Daarnaast bleken leraren in deze scholen een sterker gevoel van *self-efficacy* te hebben. Voor de overige aspecten van het verandervermogen van leraren, te weten taakinterdependentie, tevredenheid, en de mate waarin leraren hun kennis up to date houden, experimenteren en reflecteren, werd geen relatie gevonden met het toepassen gespreid leiderschap door de schoolleider.

Op basis van de resultaten uit de deelstudies kan samenvattend worden geconcludeerd dat onderzoeksmatig werken en gespreid leiderschap een sterk directe en positieve samenhang hebben met het verandervermogen van leraren. Bovendien heeft onderzoeksmatig werken daarin ook een positief mediërende rol. In de dagelijkse praktijk van een school wordt deze relatie herkend. Onderzoeksmatig werken en gespreid leiderschap worden door teamleden van veel waarde geacht, zowel in het kunnen realiseren van onderwijsontwikkeling als ten aanzien van

het gevoel van *self-efficacy*. Onderzoeksmatig werken en gespreid leiderschap vergroten de betrokkenheid van leraren bij het realiseren van veranderingen die nodig worden geacht.

## Discussie

Het doel van deze dissertatie was om meer inzicht te verkrijgen in hoe onderzoeksmatig werken en gespreid leiderschap gerelateerd zijn aan het verandervermogen van leraren. De context was die van het Nederlandse primaire onderwijs. De resultaten laten zien dat in scholen waar onderzoeksmatig wordt gewerkt en leiderschap wordt gespreid, leraren meer geneigd zijn tot samenwerken en tot het ondernemen van professionele leeractiviteiten. Ook is hun gevoel van *self-efficacy* en tevredenheid groter en zijn leraren meer geneigd om zich schooldoelen eigen te maken. Dit leidt tot een grotere betrokkenheid van leraren bij onderwijsontwikkeling op schoolniveau waardoor op adequate wijze tegemoet kan worden gekomen aan de leerbehoeften van leerlingen. De uitkomsten onderstrepen het belang van het werken met een onderzoekende houding en laten zien dat zowel individueel als gezamenlijk gebruik van data ten behoeve van school- en onderwijsontwikkeling van belang zijn. Er kan worden geconstateerd dat individueel en collectief datagebruik complementair zijn: individueel datagebruik versterkt de individuele aspecten van het verandervermogen zoals *self-efficacy*, leren door experimenteren en reflecteren en het eigen maken van schooldoelen. Gezamenlijk datagebruik versterkt de mate van het delen van kennis en ervaring en *joint work*: het gezamenlijk werken aan oplossingen en het bereiken van doelen door ervaringen, ideeën en werkwijzen uit te wisselen. Er worden dan nieuwe lespraktijken gedeeld en gebruikt ten einde tegemoet te komen aan leerbehoeften van leerlingen (Little, 1982). De constatering dat individueel en gezamenlijk datagebruik complementair zijn in onderzoeksmatig werken biedt een aanvulling op onderzoek van Hargreaves en Fullan (2012) en van Ho en Lee (2016). Zij stelden dat in het realiseren van veranderingen in de school samenwerking van belang is.

In eerder onderzoek van Brown et al. (2019) werd gevonden dat leraren die initiatieven kunnen nemen en verantwoordelijkheid kunnen dragen zich meer gerespecteerd voelen. In aanvulling daarop laten de resultaten van dit onderzoek zien dat het gevoel van gerespecteerd, gewaardeerd en gezien worden door leraren essentieel wordt geacht in zowel onderzoeksmatig werken als in het toe-eigenen van leiderschapsrollen. Dit werd in de casestudie door de leraren onderstreept. Bovendien laten de resultaten zien dat het toepassen van gespreid leiderschap, ongeacht de wijze waarop schoolleiders gespreid leiderschap interpreteren, een positieve relatie heeft met de mate waarin leraren gezamenlijk werken aan oplossingen, elkaar collegiaal ondersteunen, kennis en ervaring delen en schooldoelen zich eigen maken en dat het hun gevoel van *self-efficacy* versterkt.

Hiermee zou kunnen worden geconstateerd dat de wijze waarop gespreid leiderschap wordt vormgegeven een uitkomst mag zijn van de specifieke context in de school en de specifieke interne behoefte aan onderwijsontwikkeling.

Achtergrondkenmerken van leraren zoals leeftijd en hun aantal jaren ervaring waren niet of nauwelijks gerelateerd aan onderzoeksmatig werken en gespreid leiderschap. Een dergelijke constatering moet echter met enige voorzichtigheid worden gehanteerd vanwege de samenstelling van de responsegroep en het gegeven dat de casestudie op slechts één school is uitgevoerd. Desalniettemin kan dit betekenen dat dergelijke factoren geen belemmering hoeven te zijn en dat zowel startende als ervaren leraren kunnen worden aangemoedigd onderzoeksmatig te werken en een leiderschapsrol op zich te nemen en die elkaar te gunnen op grond van expertise. Hierin verbreden de resultaten van dit onderzoek het inzicht dat het onderzoek van Delegach et al. (2017) opleverde. Zij gaven aan dat naarmate het aantal jaren ervaring van leraren toeneemt, schoolleiders aandacht zouden moeten hebben voor het blijven uitdagen van leraren zodat zij zich betrokken blijven voelen bij de school en de schooldoelen. Waar onderzoeksmatig werken en gespreid leiderschap worden aangemoedigd, is het echter wel van belang dat er een open en transparant team- en schoolklimaat heerst waarin eenieder zich gerespecteerd voelt. Ook Fink (2016) geeft aan dat de mate waarin er sprake is van onderling vertrouwen gerelateerd is aan het handelen van eenieder in de school. Zonder vertrouwen zullen leraren minder snel naar voren stappen, onderzoeksresultaten delen en initiatieven nemen, terwijl leraren die zich gewaardeerd en gerespecteerd voelen dat meer durven te doen. Vanuit hun betrokkenheid willen zij bijdragen aan de benodigde school- en onderwijsontwikkeling.

Dit onderzoek is een studie naar onderzoeksmatig werken, gespreid leiderschap en het verandervermogen van leraren en naar hoe deze constructen al dan niet onderling verbonden zijn. Echter, deze studie geeft een beeld van de perceptie van leraren en schoolleiders 'in het moment'. Wij benadrukken dat de resultaten die in deze studie zijn gevonden niet mogen worden geïnterpreteerd als causale verbanden. Eveneens merken we het volgende op: In hoofdstuk 3 is kwantitatief onderzocht of onderzoeksmatig werken de mediërende variabele is of dat gespreid leiderschap dat wellicht is. Ondanks dat het model waarin onderzoeksmatig werken mediërend is het beste model bleek te zijn, blijft het mogelijk dat in de dagelijkse praktijk van leraren en schoolleiders de mediterende werking andersom gevonden wordt. Dit is in deze studie echter niet onderzocht en kan wellicht een rol spelen in toekomstig onderzoek.

### **Wetenschappelijk bijdrage**

Dit onderzoek is uitgevoerd in de context van het Nederlandse primair onderwijs. Vergeleken met andere onderwijssystemen kunnen de scholen in Nederland

opereren in een omgeving die vrij onafhankelijk is van voorschriften van de overheid (OECD, 2018; Neeleman, 2019). Deze autonomie wordt weerspiegeld in de mate waarin scholen vrij zijn eigen beleid te ontwikkelen, eigen keuzes te maken en uit te voeren op het gebied van bijvoorbeeld pedagogisch handelen vanuit de eigen identiteit of het eigen onderwijsconcept, en op het gebied van financieel en personeelsmanagement (Hooge, 2017). Deze vrijheid van scholen is verbonden met de verantwoordelijkheden die door de overheid naar scholen is gedecentraliseerd. Binnen een curriculum dat deels is gestandaardiseerd en indicatoren kent, kunnen scholen het curriculum zelf verder vormgeven. Scholen en besturen zijn verantwoordelijkheid voor het op orde houden van de onderwijskwaliteit, hetgeen getoetst wordt door de Onderwijsinspectie, die daarvoor kwaliteitsstandaarden hanteert die voor alle scholen gelden (Ehren et al., 2017). Vergelijken we deze Nederlandse context met bijvoorbeeld de Amerikaanse onderwijscontext, dan zien we dat in de Verenigde Staten begrippen als onderwijsbeleid, onderwijsontwikkeling, scholen en leraren fundamenteel anders worden opgevat en beschouwd (Cohen et al., 2018). Voor dit proefschrift voert het te ver om de implicaties van deze verschillen nader te duiden. Het is echter van belang om op te merken dat de resultaten van dit onderzoek naar onderzoeksmatig werken, gespreid leiderschap en het verandervermogen van leraren gekleurd zijn door de Nederlandse onderwijscontext.

De wetenschappelijke bijdrage van dit proefschrift is vierledig. Ten eerste doordat het perspectief van onderzoeksmatig werken wordt gehanteerd in plaats van dat van opbrengstgericht werken, waarin het afleggen van verantwoording centraal staat (Lai & Schildkamp, 2013). In het perspectief van onderzoeksmatig werken wordt het begrip data in brede zin gebruikt ten gunste van ontwikkelingen die in het onderwijs dat de school verzorgt nodig zijn in het tegemoet blijven komen aan leerbehoeften van leerlingen (Krüger, 2010b; 2018; Mandinach & Schildkamp, 2020; Schildkamp, 2019).

Ten tweede draagt dit onderzoek bij aan het denken over gespreid leiderschap. Veel internationale studies benadrukken de relevantie van het spreiden van leiderschap in scholen (Bagwell, 2019; Bush & Glover, 2012; Harris, 2014; Spillane & Heasley, 2010; Woods, 2016). Ook schoolteams en schoolleiders zijn meer en meer geïnteresseerd in het concept van gespreid leiderschap. Deze studie biedt inzicht in gespreid leiderschap direct of indirect gerelateerd is aan het verandervermogen van leraren. Waar eerder onderzoek (Klar et al., 2016) liet zien dat leraren meer betrokken zijn bij veranderingen in de school als de schoolleider hen betreft bij leiderschap, voegt dit onderzoek daaraan toe dat gespreid leiderschap een direct relatie heeft met de mate waarin leraren samenwerken, zij zich schooldoelen eigen maken en dat gespreid leiderschap hun gevoel van *self-efficacy* direct versterkt.

In de derde plaats draagt dit onderzoek bij aan het vergroten van de inzichten aangaande de gezamenlijke relatie van onderzoeksmatig werken en gespreid leiderschap met het verandervermogen van leraren. De resultaten die zijn beschreven in de tweede en derde deelstudie laten zien dat onderzoeksmatig werken en gespreid leiderschap beide een omvangrijke en direct positieve samenhang hebben op het verandervermogen van leraren en dat onderzoeksmatig werken daarnaast ook in sterke en positieve mate een mediërende rol heeft. Dit betekent dat de samenhang tussen gespreid leiderschap met alle deelaspecten van het verandervermogen van leraren verder versterkt wordt als leraren een leiderschapsrol op zich kunnen nemen in een omgeving waarin onderzoeksmatig wordt gewerkt. De resultaten van de casestudie voegen daar aan toe dat de relatie tussen onderzoeksmatig werken, gespreid leiderschap en het verandervermogen van leraren wordt herkend, hetgeen inzicht geeft in het belang van deze relatie voor de dagelijkse onderwijspraktijk.

Tot slot geven de uitkomsten van de vierde deelstudie inzicht in hoe gespreid leiderschap wordt geïnterpreteerd en toegepast door schoolleiders. Deze resultaten sluiten aan op eerder onderzoek van Harris en DeFlaminis (2016) en MacBeath (2005). De uitkomsten laten echter ook zien dat in scholen waarin gespreid leiderschap door de schoolleider op enigerelei wijze wordt toegepast, leraren meer geneigd blijken te zijn tot samenwerken, collegiale ondersteuning, het delen van kennis en ervaring en het internaliseren van schooldoelen dan in scholen waarin dat niet het geval is. Ook het gevoel van *self-efficacy* van leraren blijkt groter in scholen waar de schoolleider leiderschap spreidt. Volgens een literatuurstudie die Tian et al. (2016) hebben gedaan, ontbreekt een blauwdruk voor gespreid leiderschap. Ons onderzoek laat zien dat het ontbreken van consensus geen belemmering hoeft te zijn in het gebruik ervan en dat de interpretatie en toepassing van het construct door schoolleiders wordt vormgegeven in de context van de school die eigen, specifieke factoren kent. Een brede zienswijze op gespreid leiderschap blijkt functioneel, hetgeen bevindingen van Harris en DeFlaminis (2016) onderstreept.

### **Beperkingen van dit onderzoek en aanbevelingen voor vervolgonderzoek**

Dit proefschrift kent ook enkele beperkingen. De eerste beperking is dat de uitkomsten van de lerarenvragenlijst beïnvloed kunnen zijn door de neiging sociaal wenselijke antwoorden te geven en door specifieke contextfactoren van de deelnemende scholen. Sociale wenselijkheid kan worden gezien als een vertekening in de antwoorden in een sociaal wenselijke richting. Aanleiding kan zijn het willen voorkomen van teleurstelling door de persoon in zichzelf of het voorkomen van teleurstelling bij anderen (Nederlof, 1985). Noch bij de vragenlijst, noch in de interviews, is hier aandacht naar uitgegaan. Daarbij, wellicht zijn de respondenten in een omgeving werkzaam waarin al belang wordt gehecht aan onderzoeksmatig werken en gespreid leiderschap. Er zou sprake kunnen zijn van

een sterkere samenhang tussen de constructen dan wanneer er ook respondenten hadden deelgenomen die werkzaam zijn in een omgeving waarin minder sprake is van onderzoeksmatig werken en spreiding van leiderschap. In aanvulling op de uitkomsten van de vragenlijst is kwalitatief onderzoek gedaan om tot diepere inzichten te komen in relatie tot de dagelijkse praktijk van lesgeven in de school. Dit kwalitatieve onderzoek is echter uitgevoerd middels één casestudie, hetgeen eveneens een beperking is. Voor vervolgonderzoek is het aan te bevelen het kwalitatieve onderzoek uit te breiden naar meerdere scholen. Zo kunnen meer leraren worden geïnterviewd in meerdere en verschillende contexten.

Een andere beperking betreft het gegeven dat de leraren de vragenlijst eenmalig hebben ingevuld. Day et al. (2016) geven aan dat het goed zou zijn om gespreid leiderschap in meerdere meetmomenten te onderzoeken. Op grond van bovenstaande is het aan te bevelen vervolgonderzoek meer longitudinaal vorm te geven.

Tot slot, het niet in ogenschouw hebben genomen van specifieke schoolkenmerken, blijkt ook een beperking in dit onderzoek, omdat een open, transparant en veilig schoolklimaat cruciaal blijkt te zijn voor het kunnen nemen van initiatieven en verantwoordelijkheid door leraren en voor collectief datagebruik en het delen van kennis. Een klimaat waarin leraren zich gewaardeerd, gerespecteerd en gezien voelen draagt bij aan het kunnen en willen toe-eigenen van een leiderschapsrol en is van belang in onderzoeksmatig werken. Ook de wijze waarop de schoolleider de eigen schoolcontext ziet, is van belang (Leithwood et al., 2010), evenals bijvoorbeeld factoren als dagelijks voorkomende problemen of ervaren werkdruk. Ook schoolspecifieke leiderschapspatronen kunnen een rol spelen in het creëren van een klimaat waarin onderzoeksmatig wordt gewerkt en leiderschap wordt gespreid. Het is aan te bevelen om in vervolgonderzoek informatie aangaande dergelijke factoren op te nemen en te onderzoeken in welke mate deze factoren invloed hebben op onderzoeksmatig werken en gespreid leiderschap.

### **Praktische implicaties**

De resultaten uit dit proefschrift geven aanleiding tot praktische implicaties voor leraren, voor schoolleiders, voor opleidingen waarin leraren en schoolleiders worden opgeleid, en voor beleidsmakers als besturen en overheden.

De uitkomsten lijken relevant voor leraren, omdat wordt aangetoond dat onderzoeksmatig werken – het werken met een onderzoekende houding en gebruik van data in de klas en in de school – essentieel bijdraagt aan het succesvol realiseren van veranderingen in het onderwijs die nodig zijn in de school. Nieuwsgierigheid benutten en elkaar vragen stellen dragen bij aan het betrokken zijn in gezamenlijk leren, met als doel aan te kunnen blijven sluiten bij de leerbehoeften van leerlingen. Daarnaast helpt onderzoeksmatig werken de leraren in het kunnen en

durven nemen van initiatieven en verantwoordelijkheid, hetgeen het gevoel van eigenaarschap in school- en onderwijsontwikkeling versterkt.

In het creëren van een omgeving waarin onderzoeksmatig wordt gewerkt en leiderschap wordt gespreid, heeft de schoolleider een belangrijke rol. Schoolleiders kunnen leraren aanmoedigen hun onderzoekende houding te benutten en hun expertise in te zetten. Het is van belang dat schoolleiders zich realiseren dat leraren die worden uitgedaagd op een dergelijke wijze te werken en initiatieven en verantwoordelijkheid te nemen, zich meer betrokken voelen en meer tevreden zijn in hun werk waardoor ze willen bijdragen aan het bereiken van schooldoelen en het realiseren van ontwikkelingen in de school. In het spreiden van leiderschap hebben schoolleiders een belangrijke rol in de mate waarin leraren ruimte hebben een leiderschapsrol op zich te nemen (Johnson & Voelkel, 2019). Het is aan te bevelen dat schoolleiders daartoe bewegen tussen verschillende leiderschapspectieven en vertrouwen op de expertise van leraren en die van henzelf (Harris, 2014; Klar et al., 2016).

Leraren- en schoolleidersopleidingen kunnen studenten enerzijds het belang van onderzoeksmatig werken leren, en anderzijds hen de vaardigheden leren om zo te kunnen werken. Hierin kan specifieke aandacht uitgaan naar het gebruiken van de onderzoekende houding en het gebruiken van data in de brede zin, zowel individueel als collectief, omdat samen werken en samen leren dan wordt versterkt (Little, 1982; 2012). Studenten voelen de behoefte aan eigenaarschap en willen worden erkend als professionals. Dat betekent dat ze ruimte nodig hebben om zich verder te ontwikkelen en om bij te kunnen dragen aan de schoolontwikkeling. In de schoolleidersopleidingen kan er aandacht uitgaan naar de relevantie van het actief betrekken van leraren bij leiderschap. Hieraan draagt kennis over en bediscussiëren van het construct van gespreid leiderschap bij, omdat het de blik van de schoolleider op leiderschap verruimt, hetgeen het durven bieden van ruimte aan leraren ondersteunt en de behoefte aan controle kan verminderen (Pineda-Bez et al., 2019; Szeto & Cheng, 2018).

Het is bij interpretatie van de uitkomsten van dit onderzoek om een tweetal redenen van belang dat men zich realiseert dat het onderzoek plaatsvond in de Nederlandse context. Leraren die in Nederland een masteropleiding volgen, leren het belang van onderzoeksmatig werken en het belang van werken vanuit een onderzoekende houding. Hoewel een gering deel van de participanten over een masterdiploma beschikt, lieten de resultaten zien dat leraren die een masteropleiding hebben afgerond meer geneigd zijn tot onderzoeksmatig werken, hetgeen conform de inhoud van de masteropleidingen is. Ook lieten de resultaten zien dat deze leraren meer geneigd zijn hun kennis up-to-date te houden, hetgeen positief bijdraagt aan het realiseren van onderwijsontwikkeling. Leraren

aanmoedigen een masteropleiding te volgen lijkt daarmee van waarde, hetgeen aansluit bij onderzoek van Kocór en Worek (2017). Zij stelden dat het professioneel kapitaal in de school toeneemt als meer leraren een opleiding op hoger niveau hebben gevolgd. Schoolleiders en beleidsmakers beschikken over mogelijkheden tot aanmoedigen en faciliteren.

In de Nederlandse onderwijscontext hebben scholen een grote mate van autonomie (Neeleman, 2019), al is controle op output nog steeds leidend. Ondanks dat er in veel landen sprake is van deze controle op output, laten de uitkomsten in deze dissertatie zien dat een zekere mate van autonomie voor scholen wenselijk of zelfs essentieel is. Onderzoeksmatig werken en het kunnen nemen van ruimte om te werken aan school- en onderwijsontwikkeling die een school nodig acht voor de eigen leerling populatie draagt bij aan het succesvol en vanuit een gevoel van eigenaarschap kunnen realiseren van die veranderingen. Overheden en beleidsmakers zouden derhalve vertrouwen kunnen hebben in de expertise die er in scholen aanwezig is. Zij zouden scholen kunnen aanmoedigen om onderzoeksmatig te werken en leiderschap te spreiden. Daarin zouden zij zich niet slechts kunnen richten op het verbeteren van toetsresultaten maar op het bredere spectrum van hoe en waartoe leerlingen en leraren zich ontwikkelen en wat zij daarvoor nodig hebben: ruimte om eigen, weloverwogen keuzes te kunnen maken, die zijn gebaseerd op data. Ruimte om hun nieuwsgierigheid te benutten, leiderschap en verantwoordelijkheid te delen in de organisatie en vanuit de grote hoeveelheid expertise die er in scholen aanwezig is onderwijsontwikkeling te realiseren. Zo kunnen scholen aansluiten bij wat leerlingen nodig hebben om toe te kunnen groeien naar een actieve en betrokken deelname in een gezonde en veilige samenleving, beschikkend over adequate kennis, bronnen en vaardigheden.



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# APPENDICES

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## **Appendix A1**

### **Teacher questionnaire**

#### **Vragenlijst Leraren**

Welkom bij deze vragenlijst.

Fijn dat u meedoet aan dit onderzoek. Het onderzoek gaat over onderzoeksmatig werken, gespreid leiderschap en veranderen in het basisonderwijs.

U kunt de antwoorden op de vragen vrij vlot invullen, in ongeveer 15 minuten.

Bij het verwerken van de antwoorden, ook de persoonlijke achtergrondgegevens, waarborgen wij volstrekte anonimiteit. Er is een absolute garantie dat uw antwoorden anoniem worden verwerkt en niet herleidbaar zijn. Mocht u hier twijfels over hebben, neemt u dan gerust contact op.

De resultaten van het onderzoek worden in geanonimiseerde vorm gebruikt voor wetenschappelijke publicaties en worden aan de school gerapporteerd op schoolniveau. Geen enkel resultaat zal dus herleidbaar zijn tot individuele personen.

Hartelijk dank voor uw medewerking!

Judith Amels

Promotor: Prof. Dr. Klaas van Veen, Rijksuniversiteit Groningen

Copromotor: Dr. Meta Krüger, Penta Nova Academie voor schoolleiderschap en  
Dr. C.J.M. Suhre, Rijksuniversiteit Groningen





**Door de hele vragenlijst heen hebben alle vragen dezelfde antwoordmogelijkheden. Ze worden in de digitale lijst per vraag steeds aangegeven:**

Helemaal mee oneens

Enigszins mee oneens

Niet mee oneens, niet mee eens

Enigszins mee eens

Helemaal mee eens

1. *Wat is de code die u heeft gekregen bij de uitnodiging?  
Onderstaande code wordt gebruikt om een rapport op schoolniveau te schrijven, dat uw school na afloop toegezonden krijgt.*

|  |  |  |  |
|--|--|--|--|
|  |  |  |  |
|--|--|--|--|

*Met 'team' wordt het onder-, midden- of bovenbouwteam bedoeld waar u in werkt.*

2. In ons team wisselen we met elkaar ervaringen uit over het lesgeven om ons verder te ontwikkelen.
3. In ons team overleggen we met elkaar wat we in ons lesgeven aan nieuwe dingen gaan uitproberen.
4. In ons team bedenken we met elkaar manieren hoe we oudergesprekken kunnen voeren
5. In ons team evalueren we met elkaar of een nieuwe aanpak werkt.
6. In ons team overleggen we met elkaar hoe we goede instructie geven.
7. In ons team ontwerpen we samen lessen.
  
8. Voor het uitvoeren van ons werk hebben wij in ons team informatie van elkaar nodig.

9. Om ons werk goed uit te kunnen voeren, moeten wij als team te werk gaan.
10. Het werk van één teamlid beïnvloedt de uitvoering van taken van andere teamleden.
11. Om ons werk goed uit te kunnen voeren, moeten wij in ons team ons werk onderling afstemmen
  
12. Mijn collega's ondersteunen mij met positieve feedback over mijn manier van lesgeven.
13. Gesprekken met collega's over mijn werk zijn diepgaand.
14. Mijn collega's steunen mij bij het uitproberen van nieuwe werkvormen.
15. Mijn collega's vertellen mij welke problemen zij in hun lesgeven tegenkomen en hoe zij die oplossen.
16. Mijn collega's interesseren zich voor mijn lessen.
17. Mijn collega's staan mij toe dat ik in hun les kom kijken.
  
18. In ons team gaan we met elkaar om op basis van respect.
19. In ons team hebben we vertrouwen in elkaar.
20. In ons team kunnen we op elkaar rekenen.
21. In ons team communiceren we open met elkaar.
22. In ons team accepteren we opbouwende feedback.
  
23. Ik zet me in voor het realiseren van de visie op onderwijs van mijn school.
24. De doelen die wij als school hebben, dagen mij uit om me te blijven ontwikkelen.
25. Ik houd mij op de hoogte van onderwijsontwikkelingen die helpen onze schooldoelen te bereiken.
26. Ik onderschrijf volledig wat mijn school wil bereiken en handel daar ook naar.
27. Mijn lesgeven moet passen bij de visie op onderwijs van mijn school.
  
28. Ik heb het gevoel dat ik effectief kan werken.
29. Ik heb het gevoel dat ik succesvol ben in mijn werk.
30. Ik ben er zeker van dat de kwaliteit van mijn werk goed is.
31. Het lukt me goed om mijn standpunten over mijn werk uit te leggen.
32. Als ik in mijn werk iets wil, dan weet ik dat het me gaat lukken.
  
33. Werken als leraar is de leukste baan die er is.
34. Ik ga meestal met plezier naar mijn werk.
35. Ik ben tevreden in mijn werk als leraar.
36. Ik vind mijn werk zo leuk dat ik het zeker nog een tijdje wil blijven doen.
37. Als ik opnieuw zou kunnen kiezen, zou ik weer het beroep van leraar kiezen.



38. Ik neem zelf initiatief om me professioneel te ontwikkelen.
39. Zelfs als deelname niet verplicht is, neem ik deel aan na- of bijscholing.
40. Ik zoek regelmatig naar informatie die ik kan gebruiken om mijn lessen te verbeteren.
41. Ik zoek regelmatig naar informatie over onderwijskundige ontwikkelingen.
42. Ik bestudeer regelmatig lesboeken en lesmateriaal.
  
43. Ik probeer in mijn werk nieuwe werkvormen uit.
44. Als ik de kans heb, laat ik creativiteit in mijn werk zien.
45. In mijn lessen probeer ik nieuwe manieren om instructie te geven uit.
46. Ik maak zelf lesmateriaal.
  
47. Ik denk na over wat ik in mijn werk belangrijk vind.
48. Met de doelen in mijn werk voor ogen houdend, monitor ik mijn eigen ontwikkeling.
49. Ik denk na over de manier waarop ik mijn werk doe.
50. Ik vergelijk mijn lesgeven met hoe ik dat een jaar geleden deed.
51. Ik denk na over de gesprekken die ik met mijn collega's heb.
  
52. Op onze school delen leraren kennis en ervaring die ze opgedaan hebben bij na- en bijscholing
53. Op onze school delen leraren kennis en ervaringen over veranderingen die ze doorvoeren in hun lesgeven.
54. Op onze school delen leraren kennis en ervaringen die voor de kwaliteit van ons onderwijs van belang zijn.
55. Op onze school delen ervaren leraren hun kennis en ervaring met beginnende leraren.
56. Op onze school delen leraren opvattingen en ideeën over hun onderwijsvisie.
57. Op onze school delen leraren kennis over landelijke ontwikkelingen in het onderwijs.
  
58. Ik probeer in mijn werk bij veronderstellingen na te gaan of ze kloppen.
59. In mijn werk stel ik het grondig begrijpen van zaken op prijs.
60. Ik benader in mijn werk zaken vanuit verschillende perspectieven.
61. Vanuit mijn nieuwsgierigheid vraag ik systematisch door.
62. Ik lees vakliteratuur om kennis op te doen voor mijn lesgeven.

*Bij gegevens kunt u denken aan allerlei navolgbare en systematisch verzamelde gegevens zoals toets resultaten, cito-resultaten, observaties, informatie van ouders, gesprekken met leerlingen enzovoort.*

*Globale indrukken die u van een leerling hebt, horen niet bij systematisch verzamelde gegevens.*

63. Ik ben in staat om verzamelde gegevens te verwerken.
64. Ik ben in staat om verzamelde gegevens te analyseren.
65. Ik heb verstand van statistische begrippen zoals gemiddelde, betrouwbaarheid, percentage, significantie enz.
66. Ik kan tabellen en grafieken begrijpen.
67. Ik ben in staat gegevens te interpreteren.
68. Ik denk na over welke gegevens ik nodig heb voor welke doelen.
69. Ik weet wanneer gegevens betrouwbaar zijn.
  
70. Wij gebruiken externe evaluaties van bv. de inspectie om onze onderwijskwaliteit te verbeteren.
71. Analyseren van gegevens vinden wij essentieel bij het werken aan onze onderwijskwaliteit.
72. Wij baseren de doelen die we stellen voor het verbeteren van onze onderwijskwaliteit op de leerresultaten van onze leerlingen.
73. Wij werken aan onze onderwijskwaliteit door onze leerling resultaten te vergelijken met die van andere scholen.
74. Wij controleren aan de hand van gegevens, bv. toetsgegevens of een zelfevaluatie, of wij de verbeterdoelen uit ons jaarplan of ons schoolplan hebben gerealiseerd.
75. Bij het verbeteren van onze onderwijskwaliteit gebruiken we gegevens als hulpmiddel om vast te stellen wat voor ons de beste manier van onderwijs geven is.
  
76. Bij het bepalen van welke onderdelen of vaardigheden leerlingen wel of niet beheersen, pak ik gegevens over hun vorderingen erbij.
77. Bij het bepalen of mijn leerlingen extra ondersteuning nodig hebben, maak ik gebruik van gegevens over de vorderingen van mijn leerlingen.
78. Bij het voorbereiden van mijn lessen gebruik ik gegevens over de vorderingen van mijn leerlingen.
79. Bij het indelen van de leerlingen in verschillende instructiegroepen baseer ik mij op gegevens over de vorderingen van mijn leerlingen.



Voor de volgende vragen geldt:

Het leiderschapsteam wordt gevormd door de schoolleider en/of directie en/of adjunct directeur en/of bouwcoördinatoren en/of intern begeleiders – wat voor uw school van toepassing is.

80. Het leiderschapsteam op mijn school neemt mijn opvattingen, die ik als individuele leerkracht heb, serieus.
81. Het leiderschapsteam op mijn school laat waardering blijken wanneer ik zelf initiatief neem voor een verbetering van ons onderwijs.
82. Het leiderschapsteam op mijn school luistert zorgvuldig naar mijn ideeën over onderwijs.
83. Ik word gezien door het leiderschapsteam op mijn school.
  
84. Op onze school krijgen leraren de mogelijkheid om ergens het voortouw in te nemen.
85. Op onze school worden collega's die hun deskundigheid inzetten gesteund.
86. Op onze school maken we gebruik van elkaars expertise.
87. Op onze school wordt goed geluisterd naar collega's met specifieke kennis, bijvoorbeeld als zij vertellen hoe we onze instructie kunnen verbeteren.
  
88. Op onze school nemen leraren op basis van de kwaliteiten die ze bezitten regelmatig een voortrekkersrol.
89. Op onze school inspireren leraren vanuit bepaalde expertise hun collega's.
90. Op onze school oefenen leraren invloed uit op het verbeteren van ons onderwijs.
91. Op onze school bepalen leraren met kennis van zaken (bv. de taal- of rekencoördinator) hoe we de leerresultaten kunnen versterken.
92. Op onze school zetten leraren uit eigen beweging hun kwaliteiten in.
  
93. Op onze school nemen we met elkaar beslissingen omtrent de doorgaande leerlijnen over de verschillende leerjaren.
94. Leraren beslissen mee in wat wij op onze school wel en niet acceptabel gedrag van leerlingen vinden.
95. Op onze school nemen we gezamenlijke besluiten omtrent nieuwe onderwijsdoelen van de school.
96. Op onze school beslissen leraren mee in de aanschaf van nieuwe leermiddelen en lesmethoden.

97. Aan wie vraagt u binnen de school wel eens advies en waarover vraagt u dan advies?

Ook de antwoorden op deze vraag worden anoniem verwerkt en zullen in geen enkel geval herleidbaar zijn.

| Ik vraag wel eens advies aan:<br>Collega en functie<br>(bijv. collega groep 5 of coördinator<br>onderbouw) | Onderwerp (bv. rekenen, taal, cultuur,<br>tekenen, cito, leerlinggedrag,<br>oudergesprek enz) |
|--|---|
|  |   |
|  |   |
|  |   |
|  |   |
|  |   |
|  |   |
|  |   |
|  |   |
|  |   |

**Algemeen, Kruis aan wat van toepassing is:**

Hoeveel jaren heeft u ervaring als leraar in het primair onderwijs?

- Minder dan 4 jaar
- 4 jaar of meer maar minder dan 10 jaar
- 10 jaar of meer maar minder dan 15 jaar
- 15 jaar of meer.

Hoeveel jaren bent u werkzaam op deze school?

- Minder dan 4 jaar
- 4 jaar of meer maar minder dan 10 jaar
- 10 jaar of meer maar minder dan 15 jaar
- 15 jaar of meer.



In welk leerjaar bent u werkzaam? Bent u in meerdere leerjaren werkzaam, vul dan het leerjaar in waar u de meeste uren per week werkt.

Werkt u in een combinatiegroep, kruist u dan de hoogste van de twee leerjaren aan.

- Groep 1
- Groep 2
- Groep 3
- Groep 4
- Groep 5
- Groep 6
- Groep 7
- Groep 8

n.v.t. Ik heb een andere functie: onderwijssistent, klassenassistent, IB, RT, anders nl. ....

101. Hoeveel uur per week werkt u?

- Minder dan 9 uur
- 9 uur of meer maar minder dan 18 uur
- 18 uur of meer maar minder dan 26 uur
- 26 uur of meer.

102. Wat is uw leeftijd?

- Jonger dan 25 jaar
- 25 jaar of ouder maar jonger dan 35 jaar
- 35 jaar of ouder maar jonger dan 45 jaar
- 45 jaar of ouder maar jonger dan 55 jaar
- 55 jaar of ouder.

103. Wat is uw hoogst genoten opleiding?

- MBO
- HBO-Bachelor (bv Pabo)
- HBO-Master
- WO-Bachelor
- WO-Master, Doctoraat

104. Wat is uw sekse?

- Vrouw
- Man

*Dank voor het invullen van de vragenlijst!*

## Appendix A2

**Table.** Results of exploratory factor analyses concerning the main concepts in this dissertation); reliability, and factor loading

### Capacity to change / Verandervermogen

| Scale / Schaal   | Item  | Factor loading<br>Factorloading |
|--|---|---------------------------------|
| <b>Collaboration / Samenwerking;</b> Cronbach's alpha 0.78   |   |                                 |
| <b>Joint work</b><br>Eigenvalue = 1.15<br>Cronbach's alpha = .84   | In ons team wisselen we met elkaar ervaringen uit over ons lesgeven om ons verder te ontwikkelen.     | .796                            |
|  | In ons team overleggen we met elkaar wat we in ons lesgeven aan nieuwe dingen gaan uitproberen.       | .760                            |
|  | In ons team bedenken we met elkaar manieren hoe we oudergesprekken kunnen voeren.                     | .494                            |
|  | In ons team evalueren we met elkaar of een nieuwe aanpak werkt.                                       | .600                            |
|  | In ons team overleggen we met elkaar hoe we goede instructie geven.                                   | .526                            |
|  | In ons team ontwerpen we samen lessen.  | .456                            |
| <b>Task interdependency</b><br><b>Taak interdependentie</b><br>Eigenvalue = 1.93<br>Cronbach's alpha = .72 | Voor het uitvoeren van ons werk hebben wij in ons team informatie van elkaar nodig.                   | .647                            |
|  | Om ons werk goed uit te kunnen voeren, moeten wij als team te werk gaan.                              | .660                            |
|  | Het werk van één teamlid beïnvloedt de uitvoering van taken van andere teamleden.                     | .741                            |
| <b>Collegial support</b><br><b>Collegiale ondersteuning</b><br>Eigenvalue = 1.09<br>Cronbach's alpha = .85 | Om ons werk goed uit te kunnen voeren moeten wij in ons team ons werk onderling afstemmen.            | .731                            |
|  | Mijn collega's ondersteunen mij met positieve feedback over mijn manier van lesgeven.                 | .694                            |
|  | Gesprekken met collega's over mijn werk zijn diepgaand.   | .645                            |
|  | Mijn collega's steunen mij bij het uitproberen van nieuwe werkvormen.                                 | .571                            |
|  | Mijn collega's vertellen mij welke problemen zij in hun lesgeven tegen komen en hoe zij die oplossen. | .494                            |
|  | Mijn collega's interesseren zich voor mijn lessen.  | .586                            |
| <b>Trust</b><br><b>Vertrouwen</b><br>Eigenvalue = 1.68<br>Cronbach's alpha = .89                           | Mijn collega's staan mij toe dat ik in hun les kom kijken.  | .310                            |
|  | In ons team gaan we met elkaar om op basis van respect.   | .856                            |
|  | In ons team hebben we vertrouwen in elkaar.   | .846                            |
|  | In ons team kunnen we op elkaar rekenen.  | .759                            |
|  | In ons team communiceren we open met elkaar.  | .688                            |
|  | In ons team accepteren we opbouwende feedback.  | .530                            |





| Scale / Schaal   | Item   | Factor loading<br>Factorloading |
|--|--|---------------------------------|
| <b>Undertaking professional learning activities /</b>  |  |                                 |
| <b>Ondernemen van professionele leeractiviteiten door leraren;</b> Cronbach's alpha = .74                                      |  |                                 |
| <b>Keeping up to date</b><br>Eigenvalue = 4.68<br>Cronbach's alpha = .86   | Ik neem zelf initiatief om me professioneel te ontwikkelen.  | .765                            |
|  | Zelfs als deelname niet verplicht is, neem ik deel aan na- of bijscholing.                                 | .741                            |
|  | Ik zoek regelmatig naar informatie die ik kan gebruiken om mijn lessen te verbeteren.                      | .628                            |
|  | Ik zoek regelmatig naar informatie over onderwijskundige ontwikkelingen.                                   | .756                            |
| <b>Experimenting</b><br><b>Experimenteren</b><br>Eigenvalue = 1.62<br>Cronbach's alpha = .74                                   | Ik bestudeer regelmatig lesboeken en lesmateriaal.   | .629                            |
|  | Ik probeer in mijn werk nieuwe werkvormen uit.   | .515                            |
|  | Als ik de kans heb, laat ik creativiteit in mijn werk zien.  | .738                            |
| <b>Reflecting</b><br><b>Reflecteren</b><br>Eigenvalue = 1.34<br>Cronbach's alpha = .80   | In mijn lessen probeer ik nieuwe manieren om instructie te geven uit.                                      | .617                            |
|  | Ik maak zelf lesmateriaal.   | .710                            |
|  | Ik denk na over wat ik in mijn werk belangrijk vind.   | .551                            |
| <b>Sharing knowledge and experience</b><br><b>Delen van kennis en ervaring</b><br>Eigenvalue = 16.66<br>Cronbach's alpha = .89 | Met de doelen in mijn werk voor ogen houdend, monitor ik mijn eigen ontwikkeling.                          | .446                            |
|  | Ik denk na over de manier waarop ik mijn werk doe.   |                                 |
|  | Ik vergelijk mijn lesgeven met hoe ik dat een jaar geleden deed.   | .704                            |
|  | Ik denk na over de gesprekken die ik met mijn collega's heb.   | .677                            |
| <b>Sharing knowledge and experience</b><br><b>Delen van kennis en ervaring</b><br>Eigenvalue = 16.66<br>Cronbach's alpha = .89 | Op onze school delen leraren kennis en ervaring die ze opgedaan hebben bij na- en bijscholing.             | .734                            |
|  | Op onze school delen leraren kennis en ervaringen over veranderingen die ze doorvoeren in hun lesgeven     | .735                            |
|  | Op onze school delen leraren kennis en ervaringen die voor de kwaliteit van het onderwijs van belang zijn. | .714                            |
|  | Op onze school delen ervaren leraren hun kennis en ervaring met beginnende leraren                         | .563                            |
|  | Op onze school delen leraren opvattingen en ideeën over hun onderwijsvisie.                                | .655                            |
|  | Op onze school delen leraren kennis over landelijke ontwikkelingen in het onderwijs.                       | .760                            |

| Scale / Schaal  | Item   | Factor loading<br>Factorloading |
|---|--|---------------------------------|
| <b>Motivational variables, Leraarmotivatie; Cronbach's alpha = .76</b>  |  |                                 |
| <b>Internalizing school goals into personal goals</b>   | Ik zet me in voor het realiseren van de visie op onderwijs van mijn school.                    | .618                            |
|   | De doelen die wij als school hebben dagen mij uit om me te blijven ontwikkelen.                | .600                            |
| <b>Mate waarin leraren schooldoelen internaliseren tot persoonlijke doelen</b><br>Eigenvalue = 1.12<br>Cronbach's alpha = .80 | Ik houd mij op de hoogte van onderwijsontwikkelingen die helpen onze schooldoelen te bereiken. | .545                            |
|   | Ik onderschrijf volledig wat mijn school wil bereiken en handel daar ook naar.                 | .588                            |
|   | Mijn lesgeven moet passen bij de visie op onderwijs van mijn school.                           | .578                            |
| <b>Sense of self-efficacy</b><br>Eigenvalue = 1.40<br>Cronbach's alpha = .81  | Ik heb het gevoel dat ik effectief kan werken.   | .464                            |
|   | Ik heb het gevoel dat ik succesvol ben in mijn werk.   | .782                            |
|   | Ik ben er zeker van dat de kwaliteit van mijn werk goed is.                                    | .742                            |
|   | Het lukt me goed om mijn standpunten over werk uit te leggen.                                  | .588                            |
|   | Als ik in mijn werk iets wil, dan weet ik dat het me gaat lukken.                              | .678                            |
| <b>Job satisfaction Tevredenheid van leraren in hun werk</b><br>Eigenvalue = 3.06<br>Cronbach's alpha = .88                   | Werken als leraar is de leukste baan die er is.  | .819                            |
|   | Ik ga meestal met plezier naar mijn werk.  | .707                            |
|   | Ik ben tevreden in mijn werk als leraar.   | .716                            |
|   | Ik vind mijn werk zo leuk dat ik het zeker nog een tijdje wil blijven doen.                    | .817                            |
|   | Als ik opnieuw zou kunnen kiezen, zou ik weer het beroep van leraar kiezen.                    | .840                            |

Antwoordmogelijkheden: 1 = helemaal mee oneens; 2= enigszins mee oneens; 3= niet mee oneens, niet mee eens; 4= enigszins mee eens; 5 = helemaal mee eens

**Inquiry-based working / Onderzoekend werken; Cronbach's alpha = .79**

| <b>Scale<br/>Schaal</b>   | <b>Item</b>   | <b>Eigenvalue<br/>Factorloading</b> |
|---|---|-------------------------------------|
| <b>Working with an inquiry habit of mind</b><br><b>Onderzoekende houding</b><br>Eigenvalue = 8.15<br>Cronbach's alpha = .82   | Ik probeer in mijn werk bij vooronderstellingen na te gaan of ze kloppen.   | .766                                |
|   | In mijn werk stel ik het grondig begrijpen van zaken op prijs.  | .758                                |
|   | Ik benader in mijn werk zaken vanuit verschillende perspectieven.   | .720                                |
|   | Vanuit mijn nieuwsgierigheid vraag ik systematisch door.  | .742                                |
| <b>Demonstrating data literacy</b><br><b>Vaardig in het werken met onderzoeksgegevens</b><br>Eigenvalue = 2.06<br>Cronbach's alpha = .79  | Ik lees vakliteratuur om kennis op te doen voor mijn lesgeven.  | .610                                |
|   | Ik ben in staat om verzamelde gegevens te verwerken en te analyseren.   | .711                                |
|   | Ik heb verstand van statistische begrippen.   | .795                                |
|   | Ik kan tabellen en grafieken begrijpen.   | .856                                |
| <b>Data use at the school level</b><br><b>Gebruik van beschikbare gegevens in de praktijk, gericht op verbeteren van de onderwijskwaliteit op schoolniveau</b><br>Eigenvalue = 1.63<br>Cronbach's alpha = .89 | Ik ben in staat gegevens te interpreteren.  | .795                                |
|   | Ik denk na over welke gegevens ik nodig heb voor welke doelen.  | .530                                |
|   | Ik weet wanneer gegevens betrouwbaar zijn.  | .596                                |
|   | Wij gebruiken externe evaluaties van bv. de inspectie om onze onderwijskwaliteit te verbeteren.   | .677                                |
|   | Analyseren van gegevens vinden wij essentieel bij het werken aan onze onderwijskwaliteit.   | .596                                |
|   | Wij baseren de doelen die we stellen voor het verbeteren van onze onderwijskwaliteit op de leerresultaten van onze leerlingen.                                  | .669                                |
|   | Wij werken aan onze onderwijskwaliteit door onze leerlingresultaten te vergelijken met die van andere scholen.  | .642                                |
| Wij controleren aan de hand van (toets)gegevens of wij doelen uit ons jaarplan of bv. ons schoolplan die een verbetering van onze onderwijskwaliteit moeten geven, hebben gerealiseerd.                       | .846  |                                     |
| <b>Data use in classrooms</b><br><b>Gebruik van data/ gegevens in de klas</b><br>Eigenvalue = 1.30<br>Cronbach's alpha = .81  | Bij het verbeteren van onze onderwijskwaliteit gebruiken we gegevens als hulpmiddel om vast te stellen wat voor ons de beste manieren van onderwijs geven zijn. | .861                                |
|   | Bij het bepalen van welke onderdelen of vaardigheden leerlingen wel of niet beheersen, pak ik gegevens over het leren van die leerlingen erbij.                 | .822                                |
|   | Ik maak gebruik van gegevens over het leren van mijn leerlingen bij het bepalen of mijn leerlingen extra ondersteuning nodig hebben.                            | .894                                |
|   | Bij het voorbereiden van mijn lessen gebruik ik gegevens over het leren van mijn leerlingen.  | .585                                |
|   | Bij het indelen van de leerlingen in verschillende instructiegroepen baseer ik mij op gegevens over het leren van mijn leerlingen.                              | .749                                |

Antwoordmogelijkheden: 1 = helemaal mee oneens; 2 = enigszins mee oneens; 3 = niet mee oneens, niet mee eens; 4 = enigszins mee eens; 5 = helemaal mee eens

**Distrubted leadership / Gespreid leiderschap; Cronbach's alpha = .86**

| <b>Scale<br/>Schaal</b>   | <b>Item</b>   | <b>Factor<br/>loading,<br/>Factorlading</b> |
|---|---|---|
| <b>Teachers adopting<br/>leadership roles<br/>Leiderschapsrol toe-<br/>eigenen</b><br>Eigenvalue = 8.30<br>Cronbach's alpha = .88   | Op onze school nemen leraren op basis van de kwaliteiten die ze bezitten regelmatig een voortrekkersrol.  | .867  |
|   | Op onze school inspireren leraren vanuit bepaalde expertise hun collega's.  | .847  |
|   | Op onze school maken we gebruik van elkaars expertise.  | .711  |
|   | Op onze school wordt goed geluisterd naar collega's met specifieke kennis, bijvoorbeeld als zij vertellen hoe we onze instructie kunnen verbeteren. | .739  |
| <b>Teachers granting one<br/>another leadership<br/>roles Leiderschapsrol<br/>toekennen</b><br>Eigenvalue = 1.82<br>Cronbach's alpha = .92                                    | Ik word gezien door het leiderschapsteam op mijn school.  | .909  |
|   | Het leiderschapsteam op mijn school luistert zorgvuldig naar mijn ideeën over onderwijs.  | .934  |
|   | Het leiderschapsteam op mijn school laat waardering blijken wanneer ik zelf initiatief neem voor een verbetering van ons onderwijs.                 | .897  |
|   | Het leiderschapsteam op mijn school neemt mijn opvattingen die ik als individuele leerkracht heb serieus.   | .815  |
|   | Op onze school krijgen leraren de mogelijkheid om ergens het voortouw in te nemen.  | .635  |
| <b>Teachers' participation<br/>in decision-making<br/>Participatie<br/>door leraren in<br/>besluitvorming</b><br>Eigenvalue = 1.08<br>Cronbach's alpha = .72                  | Op onze school worden collega's gesteund die hun deskundigheid inzetten.  | .536  |
|   | Op onze school beslissen leraren mee in de aanschaf van nieuwe leermiddelen en lesmethoden.   | .845  |
|   | Leraren beslissen mee in wat wij op onze school wel en niet acceptabel gedrag van leerlingen vinden.  | .594  |
| <b>Teachers' active<br/>involvement in school<br/>development<br/>Betrokkenheid<br/>van leraren bij<br/>schoolontwikkeling</b><br>Eigenvalue = 1.02<br>Cronbach's alpha = .77 | Op onze school nemen we gezamenlijke besluiten omtrent nieuwe onderwijsdoelen van de school.  | .533  |
|   | Op onze school nemen we met elkaar beslissingen over de doorgaande leerlijnen over de verschillende leerjaren.                                      | .758  |
|   | Op onze school zetten leraren uit eigen beweging hun kwaliteiten in.  | .634  |
|   | Op onze school oefenen leraren invloed uit op het verbeteren van ons onderwijs.   | .632  |
|   | Op onze school bepalen leraren met kennis van zaken (bv de taal- / reken coördinator) hoe we de leerresultaten kunnen versterken.                   | .478  |

Antwoordmogelijkheden: 1 = helemaal mee oneens; 2= enigszins mee oneens; 3= niet mee oneens, niet mee eens; 4= enigszins mee eens; 5 = helemaal mee eens



### Appendix A3

**Table.** Results of confirmatory factor analyses concerning the main concepts in this dissertation (second order factors); reliability, average variance extracted by separate factors and obtained Model fit indices

| Main concepts          | Contributing factors to main concepts              | Reliability and validity separate factors |   | Conceptual fit indices of CFA 's concerning overarching concept |      |       |
|------------------------|--|---|---|---|------|-------|
|                        |  | Coefficient alpha                         | Average variance extracted from individual items (AVE) <sup>3</sup> | CFI   | TLI  | RMSEA |
| Distributed Leadership | Teachers adopting leadership roles                 | 0.920                                     | 0,666**   | .965  | .955 | .063  |
|                        | Teachers granting one another leadership roles     | 0.809                                     | 0,680**   |   |      |       |
|                        | Teachers' participation in decision-making         | 0.836                                     | 0,568**   |   |      |       |
|                        | Teachers' active involvement in school development | 0.722                                     | 0,487   |   |      |       |
|                        | Total  | 0.929                                     | 0,610**   |   |      |       |
| Inquiry-based Working  | Working with an inquiry habit of mind              | 0.787                                     | 0,427*  | .958  | .950 | .048  |
|                        | Demonstrating data literacy                        | 0.885                                     | 0,561**   |   |      |       |
|                        | Using data at the school level                     | 0.821                                     | 0,410*  |   |      |       |
|                        | Using data in classrooms                           | 0.809                                     | 0,536**   |   |      |       |
|                        | Total  | 0.906                                     | 0,465   |   |      |       |
| Collaboration          | Joint work   | 0.833                                     | 0,465*  | .959  | .954 | .047  |
|                        | Task interdependency                               | 0.847                                     | 0,491   |   |      |       |
|                        | Collegial support                                  | 0.894                                     | 0,650**   |   |      |       |
|                        | Total  | 0.925                                     | 0,515**   |   |      |       |

<sup>3</sup> The average variance extracted (AVE) is a measure of the amount of variance that is expressed by a construct in relation to the amount of variance due to measurement error. The AVE displays the discriminant validity. The AVE of each of the latent constructs should be higher than the highest squared correlation with any other latent variable (Fornell & Larcker, 1981).

| Main concepts                    | Contributing factors to main concepts               | Reliability and validity separate factors |   | Conceptual fit indices of CFA 's concerning overarching concept |      |       |
|----------------------------------|---|---|---|---|------|-------|
|                                  |   | Coefficient alpha                         | Average variance extracted from individual items (AVE) <sup>3</sup> | CFI   | TLI  | RMSEA |
| Motivation                       | Internalization of school goals into personal goals | 0.825                                     | 0,490   | .959  | .947 | .059  |
|                                  | Self-efficacy                                       | 0.811                                     | 0,476   |   |      |       |
|                                  | Job satisfaction                                    | 0.880                                     | 0,600**   |   |      |       |
|                                  | Total   | 0.898                                     | 0,531**   |   |      |       |
| Professional Learning activities | Keeping up to date                                  | 0.833                                     | 0,518**   | .966  | .958 | .045  |
|                                  | Experimenting                                       | 0.735                                     | 0,406*  |   |      |       |
|                                  | Reflecting  | 0.796                                     | 0,447*  |   |      |       |
|                                  | Sharing knowledge and experience                    | 0.887                                     | 0,574**   |   |      |       |
|                                  | Total   | 0.893                                     | 0,506**   |   |      |       |

\*Discriminant validity is not established on the construct level;

\*\*Discriminant validity is established on the construct level;

unmarked outcomes are in the margin of discriminant validity.



## Appendix A4

**Table.** Goodness of Fit measures of Confirmatory Factor Analyses concerning the basic concepts in this dissertation

| Second order Factor              | Subfactors   | CFI* | TLI* | RMSEA** | N   |
|----------------------------------|--|------|------|---------|-----|
| Distributed Leadership           | Teachers adopting leadership roles<br>Teachers granting one another leadership roles<br>Teachers' participation in decision-making<br>Teachers' active involvement in school development | .965 | .955 | .063    | 787 |
| Inquiry-based Working            | Working with an inquiry habit of mind<br>Demonstrating data literacy<br>Using data at the school level<br>Using data in classrooms   | .958 | .950 | .048    | 787 |
| Collaboration                    | Joint work<br>Task interdependency<br>Collegial support  | .959 | .954 | .047    | 787 |
| Motivation                       | Internalization of school goals into personal goals<br>Self-efficacy<br>Job satisfaction   | .959 | .947 | .059    | 787 |
| Professional Learning activities | Keeping up to date<br>Experimenting<br>Reflecting<br>Sharing knowledge and experience  | .966 | .958 | .045    | 787 |

\*The CFI and the TLI both should be greater than 0.95;

\*\*The RMSEA should be close to or lower than 0.05 (Jöreskog & Sörbom, 1996)

## Appendix A5

**Table.** Multilevel models predicting teachers' capacity to change (N = 787).  
 Independent variable is Inquiry-based working by working with an inquiry habit of mind, demonstrating data literacy, data use at the school level, and data use in classrooms (al sub variables centered)

|  |          | Models      |      |            |      |             |      |
|--|----------|-------------|------|------------|------|-------------|------|
|  |          | Empty model |      | Full model |      | Final model |      |
|  |          | Variance    | SE   | Variance   | SE   | Variance    | SE   |
| <b>Collaboration</b>                               |          |             |      |            |      |             |      |
| Joint work   | School   | .161        | .037 | .168       | .037 | .168        | .037 |
|  | Teacher  | .435        | .023 | .351       | .019 | .350        | .018 |
|  | Deviance | 1,681.666   |      | 1,558.024  |      | 1,544.275   |      |
| Task interdependency                               | School   | .004        | .005 | .009       | .005 | .009        | .005 |
|  | Teacher  | .337        | .018 | .267       | .014 | .266        | .014 |
|  | Deviance | 1,392.334   |      | 1,257.228  |      | 1,239.233   |      |
| Collegial support                                  | School   | .083        | .022 | .090       | .022 | .090        | .022 |
|  | Teacher  | .424        | .022 | .344       | .018 | .344        | .018 |
|  | Deviance | 1,633.292   |      | 1,514.190  |      | 1,502.803   |      |
| <b>Professional learning activities undertaken</b> |          |             |      |            |      |             |      |
| Keeping up to date                                 | School   | .005        | .007 | .020       | .007 | .020        | .007 |
|  | Teacher  | .440        | .023 | .230       | .012 | .230        | .012 |
|  | Deviance | 1,599.868   |      | 1,164.432  |      | 1,143.395   |      |
| Experimenting                                      | School   | .007        | .006 | .014       | .006 | .014        | .006 |
|  | Teacher  | .387        | .020 | .270       | .014 | .270        | .014 |
|  | Deviance | 1,502.370   |      | 1,274.890  |      | 1,257.773   |      |
| Reflecting   | School   | .004        | .004 | .013       | .005 | .014        | .005 |
|  | Teacher  | .275        | .014 | .143       | .008 | .142        | .008 |
|  | Deviance | 1,231.511   |      | 797.335    |      | 771.204     |      |
| Sharing knowledge and experience                   | School   | .126        | .029 | .133       | .029 | .133        | .029 |
|  | Teacher  | .444        | .023 | .331       | .017 | .330        | .017 |
|  | Deviance | 1,684.678   |      | 1,503.729  |      | 1,487.047   |      |
| <b>Motivational variables</b>                      |          |             |      |            |      |             |      |
| Internalizing school goals                         | School   | .034        | .011 | .042       | .011 | .042        | .011 |
|  | Teacher  | .311        | .016 | .193       | .010 | .193        | .010 |
|  | Deviance | 1,369.280   |      | 1,061.133  |      | 1,038.421   |      |
| Self-efficacy                                      | School   | .020        | .008 | .026       | .008 | .026        | .008 |
|  | Teacher  | .319        | .017 | .213       | .011 | .213        | .011 |
|  | Deviance | 1,372.718   |      | 1,113.230  |      | 1,091.920   |      |
| Job satisfaction                                   | School   | .121        | .029 | .125       | .028 | .125        | .028 |
|  | Teacher  | .365        | .019 | .306       | .016 | .306        | .016 |
|  | Deviance | 1,538.595   |      | 1,444.133  |      | 1,431.061   |      |





## Appendix A6

**Table.** Multilevel models predicting teachers' capacity to change (N = 787).

Independent variable: two groups of principals who did or did not apply distributed leadership in their schools

|  |          | Models      |      |                          |      |
|--|----------|-------------|------|--------------------------|------|
|  |          | Empty model |      | Full model = Final model |      |
|  |          | Variance    | SE   | Variance                 | SE   |
| <b>Collaboration</b>                               |          |             |      |                          |      |
| Joint work   | School   | .148        | .039 | .133                     | .036 |
|  | Teacher  | .437        | .025 | .434                     | .025 |
|  | Deviance | 1,376.785   |      | 1,370.556*               |      |
| Task interdependency                               | School   | .005        | .006 | .005                     | .006 |
|  | Teacher  | .350        | .020 | .350                     | .020 |
|  | Deviance | 1,164.770   |      | 1,168.563                |      |
| Collegial support                                  | School   | .082        | .025 | .067                     | .023 |
|  | Teacher  | .426        | .025 | .425                     | .025 |
|  | Deviance | 1,341.186   |      | 1,336.205*               |      |
| <b>Professional learning activities undertaken</b> |          |             |      |                          |      |
| Keeping up to date                                 | School   | .004        | .007 | .004                     | .007 |
|  | Teacher  | .465        | .027 | .466                     | .027 |
|  | Deviance | 1,346.148   |      | 1,348.032                |      |
| Experimenting                                      | School   | .005        | .006 | .003                     | .006 |
|  | Teacher  | .405        | .023 | .404                     | .023 |
|  | Deviance | 1,257.936   |      | 1,258.240                |      |
| Reflecting   | School   | .006        | .005 | .006                     | .005 |
|  | Teacher  | .284        | .016 | .285                     | .016 |
|  | Deviance | 1,034.920   |      | 1,038.366                |      |
| Sharing knowledge and experience                   | School   | .125        | .033 | .099                     | .025 |
|  | Teacher  | .433        | .025 | .433                     | .025 |
|  | Deviance | 1,364.957   |      | 1,360.146*               |      |
| <b>Motivational variables</b>                      |          |             |      |                          |      |
| Internalizing school goals                         | School   | .028        | .011 | .017                     | .009 |
|  | Teacher  | .332        | .019 | .333                     | .019 |
|  | Deviance | 1,157.483   |      | 1,152.078*               |      |
| Self-efficacy                                      | School   | .012        | .007 | .008                     | .006 |
|  | Teacher  | .328        | .019 | .329                     | .019 |
|  | Deviance | 1,135.134   |      | 1,134.611*               |      |
| Job satisfaction                                   | School   | .117        | .032 | .112                     | .036 |
|  | Teacher  | .360        | .021 | .359                     | .021 |
|  | Deviance | 1,250.712   |      | 1,153.204                |      |

\* $p < .05$

## Appendix B1

### Leidraad Interview Leraren (case study)

Vragenlijst wordt voorafgaand aan de interviews opnieuw ingevuld met als doel een vergelijking te kunnen maken tussen meetmoment 1 en meetmoment 2. Verschillen in uitkomsten zijn onderdeel in het gesprek.

Op de school zijn mogelijk in de tussentijd interventies geweest vanuit het bestuur. De bestuurder wordt hierover geïnterviewd, en ook bij de schoolleider wordt hiernaar gevraagd.

#### **Leidraad Interview Leraren** (interview ongeveer 60 minuten)

Aan het begin van het interview algemene info en toelichting vooraf:

Vorig jaar hebben jullie (leraren) meegedaan aan mijn onderzoek en een vragenlijst ingevuld. Als team scoorden jullie daar op alle punten vrij hoog.

De vragenlijst ging over onderzoeksmatig werken, veranderen, en over hoe leraren betrokken zijn en worden bij de onderwijsontwikkelingen in jullie school. In dit gesprek gaan we dieper in op hoe en waarom jullie onderzoeksmatig werken en jouw betrokkenheid bij onderwijsontwikkeling.

1. Jullie reacties op de vragenlijst laten zien dat jullie sterk onderzoeksmatig werken.
  - ~ Hoe omschrijf jij onderzoeksmatig werken; hoe doen jullie dat?  
*OZW = vaak gegevens (ook wel data genoemd) gebruiken in de klas en in de school op een systematische manier die ook navolgbaar is, om te zorgen dat jullie onderwijs beter wordt of om bv te zorgen dat je goed kunt aansluiten bij wat de kinderen in je klas aan onderwijs nodig hebben. Dat is onderzoeksmatig werken.*
  - ~ Herken je dat? Wat versta jij onder data?
  - ~ Herken je de uitkomsten van jullie school?
  - ~ Wat doe jij in je dagelijks werk in je klas op een onderzoeksmatige manier? Welke data/gegevens gebruik je?
  - ~ Wat vind jij dat onderzoeksmatig werken inhoudt?
  - ~ Hoe belangrijk vind jij het om je werk onderzoeksmatig te doen?
  - ~ Werken jullie ook als team onderzoeksmatig? En waarom doe jullie dat?
  - ~ Waaraan zou ik dat kunnen zien, als ik in jullie school een paar weken rond zou lopen?
  - ~ Bij verschil tussen M1 en M2 op onderzoeksmatig werken: hoe verklaar jij deze verschillen? Wat is er in de tussentijd veranderd?



2. Hoe ga jij om met veranderingen in je dagelijkse werk?  
(Zo nodig suggestie:) Doe je wat een ander je vertelt; bedenk je zelf hoe dingen anders en beter kunnen? Of voel je je hierin afhankelijk van anderen?
  - ~ Als het gaat over veranderen van je onderwijs, werk je dan alleen of juist samen met anderen; waar voel je je het prettigst bij? Wat vind je hierbij belangrijk? Aan welke veranderingen denk je nu: *voorbeelden geven en toelichten*
  - ~ Hoe ga je om met je eigen ontwikkeling, en vind je dat er een link is tussen jezelf ontwikkelen en veranderen?
  - ~ Bij verschil tussen M1 en M2 op verandervermogen: hoe verklaar jij deze verschillen? Wat is er in de tussentijd veranderd? Hoe kwam dat, en wat vind je ervan?
  
3. De uitkomsten van de vragenlijst laten zien dat als leraren werken met een onderzoekende houding, zij beter in staat zijn dingen in hun werk te veranderen; zij kunnen dan beter omgaan met veranderingen die "van bovenaf" komen en ze dragen ook zelf ideeën aan om dingen te verbeteren. (*Samenwerken helpt daarbij, en bv. ook hoe sterk je jezelf vindt in je werk en hoe tevreden je bent in je werk.*)
  - ~ Herken je dit verband?
  - ~ Zo ja: Welke verklaring zou jij ervoor hebben?
  - ~ Zo nee, hoe zie jij dat dan?
  
4. Hoe belangrijk vind je het om te kunnen veranderen?
  - ~ Wat zou je ervoor willen doen, welke inspanning heb je ervoor over?
  - ~ Wat zou jou helpen om dingen te kunnen veranderen? Wanneer zou je veranderen en vind je dat onderzoeksmatig werken daar voor jou bij hoort? Hoe dan?
  
5. Als je als leraar data voor je eigen klas gebruikt en ook gezamenlijk als team met data werkt, versterkt dat of en hoe je dingen in je werk kunt veranderen .
  - ~ Zie je dit in jullie school gebeuren; heb je er een voorbeeld bij?
  - ~ Herken je het dat jij daardoor beter wordt in het vernieuwen van je eigen onderwijs? Zo ja, Hoe denk jij dat het komt dat jouw verandervermogen dan sterker wordt? Zo nee, hoe gebruik jij dan die data voor je klassenpraktijk?

- 
6. Mogen jullie als leraar meebeslissen over zaken die gaan over de onderwijsontwikkeling in de hele school of in je eigen bouw?
- ~ Kun je voorbeelden geven?
  - ~ Zo ja, Vind je dat fijn; hoe belangrijk vind je het dat je die ruimte krijgt? Zo nee, wat zou je dan graag willen?
  - ~ Krijg je ook de ruimte van je leidinggevende en je collega's om je eigen ideeën in te brengen of uit te proberen als jij denkt dat iets beter kan? (Voorbeeld geven)
  - ~ En geef jij die ruimte ook aan je collega's? (Voorbeeld geven).
  - ~ Naar wie luister je gelijk en wanneer luister je minder snel naar iemand? Hoe komt dat?
  - ~ Wie vraag jij om hulp, en waarom juist bij die persoon?
7. Vind je dat er een link is tussen ruimte geven/ruimte nemen/actief betrokken zijn in de school/meedoen in besluitvorming en òf en hoe leraren in hun werk dingen veranderen? De uitkomsten van de vragenlijst laten zien dat ze iets met elkaar te maken hebben.
- ~ Hoe komt dat denk je? Of zie jij dat anders in jouw schoolsituatie?
  - ~ Hier werd ook in de vragenlijst naar gevraagd. Bij verschillen in uitkomsten tussen M1 en M2: hoe denk jij dat dit komt? Wat is er in de tussentijd gebeurd/veranderd?
8. Als het gaat om veranderen, onderzoeksmatig werken, ruimte geven/ruimte nemen/actief betrokken zijn in de school/meedoen in besluitvorming:
- ~ Wat zie jij je directeur/bouwcoördinator doen?
  - ~ Wat verwacht je van je directeur/bouwcoördinator of wat zou je nodig hebben?
  - ~ (Indien niet ter sprake gebracht:) Leggen jullie hierbij steeds een relatie met visie/missie/doelen bv uit een jaarplan of het schoolplan?
  - ~ Zou je dat belangrijk vinden, en waarom?
9. Als het gaat om al deze punten (onderzoeksmatig werken, ruimte geven, ruimte nemen, veranderen), waar hecht jij dan de meeste waarde aan?
- ~ Is de een voor jou belangrijker dan de ander, of juist niet?
  - ~ Een groot verandervermogen betekent dat scholen zelf durven te bepalen welke veranderingen ze invoeren en hoe ze dat doen. Ze kunnen dus afgewogen keuzes maken en voelen zich dan eigenaar van die keuzes en van die veranderingen. Hoe kijk jij hier tegenaan?
  - ~ Spelen hier vooral eigen persoonlijke voorkeuren een rol, of zie je een relatie met hoe jullie als team werken; en waar dan?
  - ~ Hoe zou voor jou dan je ideale werk/schoolomgeving eruit moeten zien?



10. Veranderen gaat altijd door. Zoals Loesje zegt: "Alles verandert voortdurend en dat zal altijd wel zo blijven".

Vind je dat je goed genoeg kan veranderen? Of zou je nog meer willen leren/ontwikkelen?

En wat dan?

## Appendix B2

### Leidraad Interview Schoolleider (interview ongeveer 90 minuten)

Aan het begin van het interview algemene info en toelichting vooraf:

Vorig jaar heeft jouw team meegedaan aan mijn onderzoek en een vragenlijst ingevuld. Wij hebben elkaar telefonisch gesproken en ik heb je toen gevraagd naar formeel en informeel leiderschap op je school, hoe jij daar naar kijkt en hoe je ermee omgaat.

De vragenlijst ging over onderzoeksmatig werken, veranderen, en over hoe leraren betrokken zijn en worden bij de onderwijsontwikkelingen in jullie school. Als team scoorden jullie daar op alle punten vrij hoog. Onlangs heeft je team de vragenlijst opnieuw ingevuld; de uitkomsten van beide momenten leggen we in dit gesprek bij elkaar.

1. De reacties van jouw team op de vragenlijst laten zien dat jullie sterk onderzoeksmatig werken.
  - ~ Hoe omschrijf jij onderzoeksmatig werken; hoe doen jullie dat?
  - ~ Wat versta jij onder data?
  - ~ Waarom werken jullie in jullie school op deze manier?
  - ~ En wat is jouw rol hierin?
  - ~ Herken je de uitkomsten dat jullie sterk onderzoeksmatig werken? Wat doe jij in je dagelijks werk wat betreft onderzoeksmatig werken?
  - ~ Vind je echt dat jullie als team onderzoeksmatig werken? Waaraan zou ik dat kunnen zien, als ik in jullie school een paar weken rond zou lopen?
  - ~ Hoe belangrijk vind jij het om je werk onderzoeksmatig te doen?
  - ~ En hoe belangrijk vind je het dat je leraren onderzoeksmatig werken? Stimuleer je het? Zo ja, hoe en waarom?
  
2. Jullie bestuurder en de schoolleiders hebben a.d.h.v. het schoolrapport uit de eerste vragenlijst gesproken over de uitkomsten.
  - ~ Wat is er toen aangekaart? Wat vond je daarvan? Heb je er iets mee gedaan? Zo ja, wat; zo nee, waarom niet?
  - ~ Zijn er acties uit voortgekomen? Welke, en wat denk je dat ze hebben opgeleverd?
  - ~ Bij verschil tussen M1 en M2 op onderzoeksmatig werken: hoe verklaar jij deze verschillen? Wat is er in de tussentijd veranderd?
  - ~ Heb jij op eigen initiatief actie ondernomen n.a.v. het eerste schoolrapport? Wat heb je gedaan?



3. Hoe ga jij om met veranderingen in je dagelijkse werk?
  - ~ Doe je wat een ander je vertelt; bedenk je zelf hoe dingen anders en beter kunnen? Of voel je je hierin afhankelijk van anderen?
  - ~ Als het gaat over veranderen van het onderwijs in jullie school, hoe pak jij dat dan aan; waar voel je je het prettigst bij?
  - ~ Gebruik je data om te bezien welke veranderingen noodzakelijk zijn? Gebruik je data om de stappen te bepalen in vernieuwingsprocessen? Voorbeelden?
  - ~ Hoe ga je om met je eigen ontwikkeling, en vind je dat er een link is tussen ontwikkelen en veranderen? Geldt dit voor jou en je leraren? Wat doe jij hieraan?
  - ~ Bij verschil tussen M1 en M2 op veranderen: hoe verklaar jij deze verschillen? Wat is er in de tussentijd gebeurd of veranderd?
  
4. De uitkomsten van de vragenlijst laten zien dat als leraren werken met een onderzoekende houding, zij beter in staat zijn dingen in hun werk te veranderen; zij kunnen dan beter omgaan met veranderingen die "van bovenaf" komen en ze dragen ook zelf ideeën aan om dingen te verbeteren. (Daarbij is belangrijk: samenwerkingen ook bv. hoe sterk je jezelf vindt in je werk en hoe tevreden je bent in je werk.)
  - ~ Herken je dit verband?
  - ~ Zo ja, Welke verklaring zou jij ervoor hebben?
  - ~ Zo nee, hoe zie jij dit dan wel?
  - ~ Hoe gaan jullie als team om met veranderingen "van bovenaf"? En met voorstellen tot veranderen die uit het team komen?
  - ~ Wat is jouw rol hierin? Hoe maak jij je keuzes in veranderen en bv draagvlak krijgen?
  
5. Hoe belangrijk vind je het om jouw eigen vermogen en dat van je leraren om te veranderen te vergroten?
  - ~ Wat zou je ervoor willen doen, welke inspanning heb je ervoor over?
  - ~ Wat zou jou helpen om dingen te kunnen veranderen? Wanneer zou je veranderen en vind je dat onderzoeksmatig werken daar voor jou bij hoort? Hoe dan?
  - ~ Zou je erin willen investeren? En hoe dan?
  
6. Als je gezamenlijk als team met data werkt, versterk je je vermogen om te veranderen ook.
  - ~ Zie je dit in jullie school gebeuren; zo ja: heb je er een voorbeeld bij? Zo nee, wat zou je hierin willen veranderen en waarom?
  - ~ Bij ja: hoe denk jij dat het komt dat het verandervermogen dan sterker wordt?

7. Mogen de leraren bij jou op school meebeslissen over zaken die gaan over de onderwijsontwikkeling in de hele school of in je eigen bouw? Hoe betrek je hen erbij? (Doe je alles zelf/ samen met MT/andere organisatievormen?)
- ~ Geef eens voorbeelden hierbij.
  - ~ Zo ja, Wanneer geef jij ruimte aan je collega's als het gaat om onderwijsontwikkeling in jouw school? En welke ruimte geef je dan (voorbeeld geven)?  
Zo nee, hoe komt het dat je die ruimte niet geeft? Zou je er iets aan willen veranderen, wat dan, waarom en hoe?
  - ~ Naar wie luister je gelijk en wanneer luister je minder snel naar iemand? Hoe komt dat?
8. Gespreid leiderschap is het idee dat leiderschap niet in een persoon zit maar dat iedereen in het team een leiderschapsrol kan hebben, bv omdat iemand over een bepaald onderwerp veel kennis heeft. Dat is dan informeel leiderschap. Er is dan bv. ook sprake van gedeelde verantwoordelijkheid in onderwijs- en schoolontwikkeling. Dit gaat over ruimte geven/ruimte nemen/actief betrokken leraren/meedoen in besluitvorming.
- ~ Hoe zie jij dit in jouw school? Zijn er hier informele leiders en wie zijn dat dan? Hoe denk je dat het komt dat het juist deze collega's zijn?
  - ~ Welke rol speel jij hierin, en hoe speelt schoolklimaat er voor jou een rol in?
  - ~ Maak je gebruik van informele leiders, en waarbij dan? Wat zie ik je hierbij doen (voorbeeld)?
9. Vind je dat ruimte geven/ruimte nemen/actief betrokken zijn in de school/meedoen in besluitvorming iets te maken hebben met òf en hoe leraren in hun werk dingen veranderen?
- De uitkomsten van de vragenlijst laten zien dat gespreid leiderschap en òf en hoe leraren in hun werk dingen veranderen, iets met elkaar te maken hebben.
- ~ Wat denk jij dat de link is?
  - ~ En welke verklaring zou je hieraan geven?
10. Als het gaat om al deze punten (onderzoeksmatig werken, ruimte geven, ruimte nemen, veranderen), waar hecht jij dan de meeste waarde aan?
- ~ Is de een voor jou belangrijker dan de ander, of juist niet?
  - ~ Een groot verandervermogen betekent dat scholen zelf durven te bepalen welke veranderingen ze invoeren en hoe ze dat doen. Ze kunnen dus afgewogen keuzes maken en voelen zich dan eigenaar van die keuzes en van die veranderingen. Hoe kijk jij hier tegenaan?
  - ~ Spelen hier vooral eigen persoonlijke voorkeuren een rol, of zie je een relatie met hoe jullie als team werken; en waar dan?
  - ~ Hoe zou voor jou dan je ideale werk/schoolomgeving eruit moeten zien?





11. Als het gaat om veranderen, onderzoeksmatig werken, ruimte geven/ruimte nemen/actief betrokken zijn in de school/meedoen in besluitvorming:
  - ~ Wat zou ik jouw zien doen?
  - ~ Wat denk je dat je leraren van jou nodig hebben?
  - ~ (Indien niet ter sprake gebracht:) Leggen jullie hierbij steeds een relatie met visie/missie/doelen bv uit een jaarplan of het schoolplan?
  - ~ Vind je dat belangrijk, en waarom?
  
12. Veranderen gaat altijd door. Zoals Loesje zegt: "Alles verandert voortdurend en dat zal altijd wel zo blijven". Wat zou jij in dit kader verder willen leren?
  
13. In het afgelopen jaar is jullie leerlingaantal sterk gegroeid. Wat betekent dit voor jouw rol als het gaat over onderzoeksmatig werken, veranderen en elkaar ruimte geven of ruimte nemen bij schoolontwikkeling? En wat betekent het volgens jou voor de leraren? Wat zie je gebeuren. Wat zou je graag willen dat de leraren doen? Hoe denk je dat je op dat punt kunt komen (als je er nu nog niet bent)?

## Appendix C

### Interviewvragen voor schoolleiders (telefonisch, ongeveer 20 minuten):

1. *Over de formele leiderschapsrollen:*
  - a) Is er op uw school een adjunct-directeur?
  - b) Zijn er op uw school bouwcoördinatoren / intern begeleiders; hoeveel?
  - c) Maken zij deel uit van een managementteam? Wie zitten daar nog meer in?
  - d) Hoeveel LB-leerkrachten zijn er op uw school?
  - e) Zijn er naast deze rollen ook informele leiders in uw school? Wie zijn dat dan?
  - f) Zijn er nog andere rollen in uw school, of tijdelijke functies? Geeft u bv iemand wel eens ergens een tijdelijk coördinatorschap voor? Voor wat/ hoe lang?

*Gespreid leiderschap hanteert het idee dat leiderschap niet in één persoon zit maar dat iedereen in het team een leiderschapsrol kan hebben, bv omdat iemand over een bepaald onderwerp veel kennis heeft. Dat is dan "informeel leiderschap". En er is bijvoorbeeld ook sprake van gezamenlijke besluitvorming en gedeelde verantwoordelijkheid als het gaat om schoolontwikkeling.*

2. Hoe ziet u dat in uw school? Zijn er in uw school informele leiders? Geeft u uw leerkrachten ruimte om initiatieven te nemen, bv. als ze ergens veel kennis over hebben? Geef alstublieft voorbeelden.
3. Maakt u gebruik van informele leiders, en waarbij dan?
4. Wat u nu vertelt, is uw idee (uw perceptie). Hoe denkt u dat uw leerkrachten dit zien?



## Appendix D

### Declaration concerning the manuscripts included

Researchers involved in the study:

|                        |    |
|------------------------|----|
| J. Amels MSc           | JA |
| Prof. Dr. K. van Veen  | KV |
| Dr. M. L. Krüger       | MK |
| Dr. C. J. M. Suhre     | CS |
| A.J. M. Nobel MSC      | AN |
| Dr. L. Uiterwijk-Luijk | LU |

### In general

The subject of this dissertation was initiated by JA. JA wrote the proposal pertaining to the research. During this writing process, MK regularly read the proposal and gave feedback. In 2014, the proposal was presented by MK to KV, accompanied by the question whether KV would supervise the PhD project. KV's answer was positive. JA, in consultation with KV and MK, made several small adjustments to the proposal.

All the manuscripts included in this dissertation are primarily assigned to JA.

### **Manuscript 1 (Chapter 2): Impact of inquiry-based working on the capacity to change in primary education**

In designing this manuscript, which considers to what extent teachers' inquiry-based working in primary schools predicts their capacity to change and what aspects of inquiry-based working are the most important drivers, JA was supported by KV and MK. In SPPS (version 24), JA cleaned the data, performed factor analyses and determined the scales' compositions following an adequate Cronbach's alpha. By focusing on validity, within those factor analyses, JA chose to handle the fixed factors with respect to the scales of distributed leadership and teachers' change capacity. In the multilevel analyses, CS supported JA. JA was responsible for writing the concept manuscript and the writing process. KV, MK and CS provided the concept text with remarks and feedback.

### **Manuscript 2 (Chapter 3). The effects of distributed leadership and inquiry-based work on primary teachers' capacity to change: testing a model.**

In designing this manuscript, which considers how distributed leadership and inquiry-based working affect teachers' capacity to change, JA was supported by KV, MK and CS. CS wrote the syntaxes. JA performed the syntaxes in LISREL (version 8.52) and interpreted the outcomes. In the process of interpreting, JA was supported by CS. JA was responsible for writing the concept manuscript and the writing process. KV, MK and CS provided the concept text with remarks and feedback.

**Manuscript 3 (Chapter 4): The relationships in distributed leadership, inquiry-based working and realizing educational change in Dutch primary education: teachers' and their school leader's perceptions.**

In the case study, the interviews with the teachers and the school leader were performed by JA. The interviews were recorded and transcribed. In the qualitative analyses of the data, JA (first encoder) and AN (second encoder) coded the interviews independently. Based on the scales of the teachers' questionnaire, JA edited a codebook, using the deductive approach. In the printed, transcribed interviews, AN and JA highlighted the sentences that represented a code. Differences in coding were discussed, after which decisions regarding the code-sentence combination were made. During this process of discussing, new codes arose, and the inductive approach was used. After establishing the codes in the interviews, JA imported all coded interviews in Atlas-ti (version 1.6.0).

In designing this manuscript, in which the teachers' and their school leader's perceptions regarding the relationships between distributed leadership, inquiry-based working and realizing educational change were investigated, JA was supported by MK. JA was responsible for writing the concept manuscript and the writing process. MK and KV provided the concept text with remarks and feedback.

**Manuscript 4 (Chapter 5): The relationships between primary school leaders' utilization of distributed leadership and teachers' capacity to change.**

The interviews by telephone were performed by AN and JA. The interviews were recorded and transcribed (after being anonymized). JA (first encoder) and LU (second encoder) analyzed the interviews. Prior to the analysis, JA determined the codes ("I do not apply distributed leadership in my school," "I partly apply distributed leadership in my school," "I apply distributed leadership in my school"). In an Excel-file, LU and JA categorized the school leaders' perceptions (using the school codes) and highlighted the sentences that represented the classification. Differences in coding were discussed, after which decisions regarding classification were made. During this process of discussing, a new code arose, namely, "Not described concretely." The results of the analysis that LU and JA performed were meant to answer the first research question in this study—How do school leaders perceive and apply the distributed leadership perspective in their schools?

With regard to the second research question—Which aspects of teachers' capacity to change are more present in schools in which the principals apply a distributed leadership perspective than in schools without such a perspective?—CS and JA collectively performed the multilevel analysis in SPSS (version 24). JA was responsible for writing the concept manuscript and the writing process. MK, CS and KV provided the concept text with remarks and feedback.



## DANKWOORD (ACKNOWLEDGEMENTS)

Met veel plezier schreef ik in 2011 mijn masterthesis Onderwijskunde. De kenniskring Leiderschap in het onderwijs van Penta Nova, met Meta Krüger als lector, droeg in grote mate bij aan dat plezier. Dat ik daarin als schoolleider mee mocht doen, was vanaf het begin voor mij bijzonder. Ik genoot ervan! Toen ik mijn thesis afrondde en tegen jou, Meta, zei dat ik graag door zou willen gaan met onderzoek doen en een promotieonderzoek ambieerde, zei jij direct dat ik dat zeker moest gaan doen en dat jij mijn copromotor wilde zijn. Je hebt er altijd vertrouwen in gehad dat een promotietraject zou lukken. Soms sprak je het uit; ik heb het steeds gevoeld. Ik wil je enorm bedanken voor de fijne samenwerking, je luisterend oor, je spitsvondigheid en scherpheid in het schrijven; kortom, voor alles wat ik van je heb geleerd. Ik kon altijd bij je terecht, zowel online als bij je thuis, aan de grote eettafel, op je dakterras of op je werkkamer. Naast de begeleiding in dit promotietraject en hoe je dat deed, heb ik ook veel van je geleerd over mijzelf. Voor mij een minstens zo belangrijke opbrengst die ik verder meeneem. Heel veel dank voor alles!

Met mijn promotor Klaas van Veen ben ik van begin tot eind heel blij geweest. Klaas, ook jij hebt steeds het vertrouwen gehad dat ik dit traject als buitenpromovendus kon doen. We hebben samen, en ook met Meta en Cor erbij, veel gesprekken gevoerd tijdens het schrijven van de artikelen. Dat deden we in Groningen, Utrecht, Leiden of Antwerpen, waar we de agenda's maar op elkaar afgestemd konden krijgen. Je bent enorm scherp in het geven van feedback, en dat deed je altijd opbouwend en waarderend. Ik heb veel bewondering voor hoe jij teksten leest, verbanden ziet en deze weet aan te scherpen en te verwoorden. Je zorgde ervoor dat ik mijn stukken sterker onderbouwde en dat ik steeds meer to the point kwam. Ik heb je positieve houding en de fijne toon in onze gesprekken altijd erg gewaardeerd! Dank voor alles wat ik ook van jou heb mogen leren, voor je vertrouwen, je begeleiding en de wijze waarop je soms een relativerende toon in bracht.

In een van de eerste gesprekken in Groningen stelde jij, Klaas, voor dat Cor mee zou gaan doen als methodoloog. Cor, wat ben ik je dankbaar dat je dit wilde! Op het gebied van methodologie, syntaxen en data-analyse heb ik heel veel van je geleerd. Als ik vragen had, kon ik altijd bij je terecht. Zelfs in vakanties reageerde je op mijn mails. Rechtstreekse antwoorden kwamen er niet zo vaak, maar je stelde precies die vragen die mij weer aanzetten tot nadenken en besluiten nemen. Ook aan jou enorm veel dank voor je hulp en je begeleiding! Klaas, Meta en Cor, ik heb genoten van het onderzoek doen en van onze samenwerking in de afgelopen jaren. Dit moment geeft mij een dubbel gevoel: ik vind het jammer dat het klaar is, en tegelijk is het ook goed dat het klaar is.

Met heel veel plezier kijk ik terug op de kenniskring. Ik kon er mijn voortgang delen, vragen voorleggen; 'mijn fiets werd er gesloopt' (zoals we vaak tegen elkaar zeiden en waar we dan met een grimas om lachten) waarna er oprecht werd gevraagd of ik weer verder kon. Wat was het leuk om met elkaar congressen te bezoeken en onze onderzoeken te presenteren. Reykjavik, Istanbul, Glasgow en Ottawa: voor mij waren het hoogtepunten.

In het bijzonder wil ik Agnes Nobel en Lisette Uiterwijk bedanken. Ik ben heel blij dat jullie mijn paranimfen willen zijn. Lisette, we leerden elkaar kennen in de kenniskring. Ik mocht met jou meedenken in jouw promotieonderzoek en jij wilde mij helpen bij mijn traject. Als ik een vraag aan je voorlegde, maakte je tijd, zelfs als er op heel korte termijn iets nodig was. Wat hebben we tijdens onze beider onderzoekstrajecten mooie gesprekken gevoerd! Dank daarvoor! Al is het voor onze allebei afgerond, onze interesse blijft. En ik hoop dat onze mooie gesprekken in de komende jaren doorgaan.

Agnes, we studeerden samen aan de UvA en langzaam aan bouwde ons contact verder uit tot vriendschap. Toen ik je vertelde dat ik promotieonderzoek mocht gaan doen, was je reactie direct: "Wat leuk! Mag ik je dan helpen?". Vele uren hebben we de schoolleiders geïnterviewd, over van alles van gedachten gewisseld en eindeloos gecodeerd. Soms had je allerlei nieuwe concepten of ideeën waarvan je vond dat die echt een plek in mijn onderzoek moesten krijgen. Ook al legde ik ze regelmatig terzijde, je inspiratie en enthousiasme waren steeds hartverwarmend. Ik ben je enorm dankbaar voor de gezellige uren met thee en chocola, voor je kritische vragen en al je hulp, en voor al die momenten waarop afstand er niet toe deed en ik tegen aan je mocht praten.

Een woord van dank aan alle schoolleiders en leraren die mee wilden werken aan dit onderzoek is zeker op zijn plaats. Zonder hen had ik dit onderzoek niet kunnen doen. Een speciaal woord van dank wil ik richten tot José en haar teamleden. Dat ik tijd bij jullie op school mocht doorbrengen om te horen hoe onderzoeksmatig werken en gespreid leiderschap in de dagelijkse praktijk werken en helpend of soms zelfs noodzakelijk zijn, heb ik bijzonder gewaardeerd. Dank voor het fijne contact, de mooie inspirerende gesprekken en het vertrouwen dat jullie mij hebben gegeven!

Toen ik dit promotieonderzoek begon, werkte ik als schoolleider. Met trots kijk ik terug op het team waar ik in die tijd mee samenwerkte en op de prachtige ontwikkelingen die we daar onderzoeksmatig werkend met elkaar hebben gerealiseerd. We waren eigenwijs, en verfoeiden de verantwoording die opbrengstgericht werken met zich meebracht. We vonden het vanzelfsprekend dat we verantwoording aflegden, maar dat zagen we als bijzaak. Het ging ons om de kinderen, Voor hen wilden we onze gegevens gebruiken, zodat we ze het best mogelijke onderwijs konden



geven. We deden het voor Ruben die leren lezen zo moeilijk vond. Voor Sem die een mooi rapport had maar niet gelukkig was. Voor Annemieke die een kanjer op het hockeyveld was maar de sommen tot 100 zo moeilijk vond. En voor Marc die vijf jaar oud was, erg moest huilen bij de zwemles en toch in groep 3 wilde blijven omdat hij wilde lezen en rekenen. En voor nog veel meer kinderen. Al deze kinderen zijn voor altijd in mijn hart gesloten. Net als de collega's die kwamen met initiatieven en ideeën. Jullie verzorgden workshops voor elkaar, stelden vragen en brachten eigen kennis in. Wat was ik trots op hoe we onze eigenwijsheid benutten, hoe aan ieder ruimte werd gegund en hoe jullie de ruimte hebben ingenomen. Mede die wijze van werken heeft mij geïnspireerd om verder te gaan onderzoeken hoe onderzoeksmatig werken en het spreiden van leiderschap samenhangen met het realiseren van goed onderwijs voor alle leerlingen. Dat ik nu al deze kennis en ervaringen mag delen met andere schoolleiders, ervaar ik als bijzonder.

Ook mijn ouders wil ik hier graag noemen. De liefde voor onderwijs heb ik in mijn genen meegekregen. Wat jammer dat ik mijn onderzoekstraject niet met jullie heb kunnen delen. Vooral mama had elk studieboek willen zien, of het nu over onderwijs of over methodologie ging. Ik weet dat jullie trots zouden zijn geweest. Tot slot, bovenal een woord voor Paul. Lieve Plus, zonder jou was dit proefschrift schrijven mij niet gelukt. Dank je wel voor alle ruimte die je mij hebt gegeven, alle bekers thee die je boven hebt gebracht in de uren dat ik "op mijn kantoor" zat, je geduld en je blijheid als er iets was gelukt. Iedere keer als ik zei dat ik nog "even" naar boven ging, was dat goed; je mopperde nooit dat het ongezellig was, al was het dat soms wel. Dank je wel, mijn allerliefste Plus, voor je onvoorwaardelijke liefde!

*Januari, 2021*

## ABOUT THE AUTHOR

Judith Amels-de Groot was born on April 6<sup>th</sup>, 1962 in Haarlem, the Netherlands. After obtaining her secondary school diploma (VWO) from the Eerste Christelijk Lyceum in 1981, she started her study at the Da Costa university of applied sciences to become a primary school teacher. Since 1984, she worked as a teacher in all grades and in various primary schools. In her work as a teacher she became more and more aware of the importance of listening carefully to all students and their specific educational needs in order to enable them all to flourish and especially to be happy in the classroom, regardless of their physical or cognitive abilities.

In 2001 she completed a school leadership course and started working as a school leader in Rijnsburg, followed by a job as school leader in Haarlem in 2004.

During her work as school leader, Judith started a two-year pre-master's degree in Educational Sciences at the University of Amsterdam in 2008, followed by a one-year master's degree in the same discipline. In 2011 she obtained her Master of Science degree cum laude. After the school where Judith worked as a principal received an extremely positive report from the Dutch inspectorate in 2016, it was time to move on. For the next two years, Judith worked at Hogeschool Inholland in a master's degree for teachers. In 2018 she started working at the Marnix Onderwijs Centrum (MOC), an institute for further training and educational advice for primary schools, which is part of the Marnix Academy. The Marnix Academy is a partner within Penta Nova, Academy for Leadership in Education. Judith currently works as a curriculum developer and teacher trainer for both the MOC and Penta Nova. In 2014, in addition to her work as a school leader, and later on as a curriculum developer and teacher trainer, she started her PhD study at the University of Groningen.





# LIST OF PUBLICATIONS

## **Scientific publications (peer-reviewed)**

- Amels, J., Krüger, M. L., Suhre, C. J. M., & Van Veen, K. (2019). Impact of inquiry-based working on the capacity to change in primary education. *Journal of Educational Change*, 20(3), 351–37
- Amels, J., Krüger, M. L., Suhre, C. J. M., & Van Veen, K. (2020). The effects of distributed leadership and inquiry-based work on primary teachers' capacity to change: Testing a model. *School Effectiveness and School Improvement*, DOI 10.1080/09243453.2020.1746363
- Amels, J., Krüger, M. L., Suhre, C. J. M., & Van Veen, K. (2020). The relationship between primary school leaders' utilization of distributed leadership and teachers' capacity to change. *Educational Management Administration & Leadership*, DOI: 10.1177/1741143220915921
- Amels, J., Krüger, M. L., & Van Veen, K. (2020). Relationships in distributed leadership, inquiry-based working, and realizing educational change in Dutch primary education: Teachers' and their school leader's perceptions. *International Journal of Leadership in Education*, DOI: 10.1080/13603124.2020.1842505

## **Professional publications**

- Amels, J. & Krüger, M. L. (2014). De samenhang tussen onderzoeksmatig leiderschap, gespreid leiderschap en de verandercapaciteit in de school. In: Krüger, M. L. (red.), *Leidinggeven aan onderzoekende scholen*. Bussum: Coutinho
- Amels, J. & Uiterwijk, L. (2015). Voorkom ruis bij interpreteren data. *SchoolManagement*, 17(2), 7–9.
- Amels, J. (2018). Onderzoekend werken en gespreid leiderschap. Wie het weet, mag het zeggen. *SchoolManagement*, 20(4), 14–17
- Amels, J. & Teunis, G. (2018). Eruit halen wat erin zit, maar hoe doe ik dat? Onderzoeksmatig werken in de context van gespreid leiderschap in het PO.
- In: Krüger, M. L. (red.), *Onderzoeksmatig leiderschap in de praktijk. Handreikingen voor schoolleiders en bestuurders*. Den Haag: ACCO
- Amels, J. (2019). Informeel leren versterkt het schoolleiderschap. *Basisschoolmanagement*, 2, 9–11
- Amels, J. (2020). Onderzoeksmatig werken versterkt gespreid leiderschap. *Basisschoolmanagement*, 7, 22–24

## **Selection of conference contributions**

- Amels, J. (2016). *Inquiry-based working, developmental capacity and leadership in the perspective of distributed leadership in Dutch primary schools*. Poster presented at International Congress for School Effectiveness and School Improvement, Glasgow, Scotland
- Amels, J. (2016). *Teachers' and schools' development by inquiry-based working*. Paper presented at European Association for Practitioner Research on Improving Learning, Porto, Portugal
- Amels, J. (2017). *Inquiry-based working, distributed leadership and change capacity in Dutch primary schools*. Poster presented at International Congress for School Effectiveness and School

Improvement, Ottawa, Canada

Amels, J. & Teunis, G. (2017). *Inquiry based working in eight primary schools in the Netherlands: a case study*. Paper presented at International Congress for School Effectiveness and School Improvement, Ottawa, Canada

Amels, J. (2017). *De invloed van onderzoeksmatig werken en gespreid leiderschap op het verandervermogen van scholen in het primair onderwijs*. Paper presented at Onderwijs Research Dagen, Antwerpen, Belgium

Amels, J. (2018). *Gespreid leiderschap, onderzoekend werken en het verandervermogen van leraren in het primair onderwijs – het model getoetst*. Paper presented at Onderwijs Research Dagen, Nijmegen, The Netherlands

Amels, J. (2019). *How distributed leadership and inquiry-based working have impact on teachers realizing educational change*. Paper presented at International Congress for School Effectiveness and School Improvement, Stavanger, Norway

Amels, J. (2019). *Informal leadership roles within the distributive leadership perspective: school leaders' perceptions*. Poster presented at International Congress for School Effectiveness and School Improvement, Stavanger, Norway

