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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 are related to teachers' capacity to change leads to theories about the knowledge and beliefs of leaders with regard to distributed leadership that are crucial for achieving educational change 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 indicate that several aspects of teachers' capacity to change, namely, joint work, collegial support, knowledge sharing, self-efficacy and their 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.

Keywords

Distributed leadership, teachers' involvement in leadership, inquiry-based working, educational change

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, and this encompasses conditions and skills at both the school and teacher level that strengthen teachers' professional learning and teaching strategies (Stoll, 2009; Thoonen et al., 2011).

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Research on the realization of change by teachers showed that in addition to factors such as teachers' expertise, school culture and team members' interrelationships, distributed leadership is relevant (e.g. Amels, Krüger, Suhre, & van Veen, 2020; Brown et al., 2019; Leithwood et al., 2010). Distributed leadership involves teachers taking and granting leadership roles according to expertise and problems to be addressed; they do so by taking the initiative and assuming responsibility (e.g. Harris, 2013; Spillane, 2012). Whether school leaders adopt distributed leadership as a starting point for their school organization is dependent on their perceptions of this particular leadership perspective (Harris and DeFlaminis, 2016; Woods, 2016) and, in turn, these perceptions largely depend on their judgements of teachers' competences and expertise (Jones and Harris, 2014; Spillane, Camburn, & Pareja., 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 as to what knowledge and beliefs about distributed leadership principals should have to effect 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 adopt 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, 2012; Spillane and Healey, 2010; Spillane et al., 2004), we conceptualize distributed leadership as a perspective on leadership in the organization, which then manifests itself as a dynamic process among all team members. In this study, the school team encompasses the teachers and all other employees such as teaching assistants and teachers who have additional formal tasks. Depending on the types of problems to be addressed, team members can take leadership roles depending on their knowledge, affinity with a particular role 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, 2012). Principals, as the formal leaders, should aim to align talent and expertise with the school's vision and goals and recognize that a systematic analysis of how these goals are developed over time must be undertaken (Yeigh et al., 2019).

In addition to depending on the field of reference (e.g. organizational matter, educational subject, among others), the effective application of distributed leadership in a school depends on the school leader's perception of the concept (Harris and DeFlaminis, 2016; Woods, 2016), his/her beliefs about the expertise and personal capabilities of the school's teachers (Jones and Harris, 2014; Spillane et al., 2007) and his/her understanding of the context and the school's needs (Day et al., 2016). A principal's attitude is of importance as well. For example, as an autocratic leader, the principal can make decisions because he/she has the authority. In contrast, according to the distributed perspective, principals facilitate, broker and support teachers to take a leadership role, which requires different skills (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 and 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 and DeFlaminis, 2016; MacBeath, 2005). For example, MacBeath (2005) distinguished between three different interpretations. First, when school leaders grant space to team members for reaching a longer-term goal for 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 et al., 2017). The delegated tasks may be related to organizational matters 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 (see also Hargreaves and Fink, 2008).

In line with these different interpretations, two approaches can be distinguished in distributed leadership: (a) distributed leadership as a tool for analysing leadership practices in the school; and (b) distributed leadership as a framework for organizing leadership. This study follows the second perspective, as we investigate school leaders' perceptions of distributed leadership and whether they recognize this perspective as a way of working in their school. We base our description of distributed leadership on the works of Spillane (2012) and Harris (2013), 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 society's demands continually change, teachers' capacity to change represents a competence; teachers can develop such a dynamic feature over time. This capacity to change refers to the extent to which educators are able to manoeuvre in relation to 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 purposes of enhancing student learning (Harris et al., 2015; Stoll, 2009). In the current 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 their learning.

In line with Stoll (2009, 2013), Ho and Lee (2016), Geijsel et al. (1999) and Geijsel, Slegers, Stoel, and Krüger (2009), we operationalize teachers' capacity to change using three aspects: (a) interpersonal (teacher collaboration); (b) organizational (teachers' professional learning activities); and (c) personal (motivational variables). First, collaboration to attain certain goals contributes to realizing educational change (Ho and Lee, 2016). In interactions, teachers meet nonroutine actions and collectively make sense of changes by using their body of knowledge. This will determine whether and how they will implement changes (Hadfield and 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 and Oates, 2017).

Second, with regard to the organizational aspect, teachers who undertake professional learning activities keep themselves up to date in relation to educational developments and new issues. This 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 (Geijsel et al., 2009; Camburn and Han, 2017).

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 behaviour successfully and can organize and execute the actions required to produce the given levels of achievement (Pajares, 1996). Job satisfaction reflects positive emotional feelings achieved from positive experiences within one's job (Singh and Kaur, 2010). Satisfied teachers feel more comfortable in contributing to 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 wellbeing in the organization. Teacher involvement in leadership can enhance teachers' self-efficacy and motivation (Day et al., 2016) and lead to a strong commitment to organizational performance among teachers (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, a teacher's 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 and Karvonen, 2018). In addition, a distribution of leadership roles contributes to realizing change because in working together, professional and collaborative learning will be strengthened (Hadfield and 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 have assumed that distributed leadership is relevant for reinforcing teachers' ability to change (e.g. Diamond and Spillane, 2016; Harris, 2013; Holloway et al., 2017; Spillane, 2012; Yeigh et al., 2019). Furthermore, they have assumed that whether and how leadership roles are distributed depends (among other things, e.g. structural and cultural aspects) on the principals' perceptions of distributed leadership (Harris and DeFlaminis, 2016; Woods, 2016). However, insights into the *how* of leadership distribution practices and their 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 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 approaches to pedagogical, personnel and financial management policies, quality standards are applied to all schools, ensuring quality of education 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 quality of education 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 are the inspectorate's reports. Currently, at the request of the Ministry of Education, Culture and Science, teachers and principals working in 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 aim to achieve the quality standards will be up to them, which was also the case during this study. The inspectorate holds schools accountable for their quality of education and output results. The extent to which team members are allowed to be creative and take the initiative as well as their involvement in innovation are assumed to enhance the organization's capacity to learn and change (Johnson and Voelkel, in press). Therefore, it is important for school leaders to exploit the expertise available in the team and encourage teachers to take the initiative and assume 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 design, quantitative and qualitative data are collected in a single phase. The datasets are analysed separately, and then the results from the analysis of both datasets are brought together (Cresswell, 2014).

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

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

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

Demographic characteristic		<i>n</i>	%
Gender	Female ^a	703	89
	Male ^a	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	Grades 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

^aThe female/male distribution reflected that of the Dutch primary school teacher population (87% female, 13% male; see www.statline.nl).

($n = 16$) does not reflect that of the larger population of Dutch primary school principals (47% female, 53% male; see www.schoolleidersregisterpo.nl). In the Netherlands, a professional standard (Andersen and 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 as yet no consequences if they do not comply. In our study, all participating principals were registered, which means they have 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 to which teachers with formal adjusted leadership roles belonged. 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 because he considered that all team members were involved in school development.

Instruments

Semistructured interviews with the school leaders. In a semistructured telephone interview, which lasted approximately 20 minutes and was recorded, first, questions were asked about the formal organizational structures in the school, and the principal's number of years of leadership experience. The interviewers read aloud their description of distributed leadership based on Spillane (2012) and Harris (2013). Then, the principals were asked whether they apply distributed leadership in their schools and how they perceive it. 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 the principals to give examples to support their answers by

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 ^a	Example item	Number of items	Cronbach's α
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	Experimentation	I try new ways of instructional strategies.	4	.74
	Reflection	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

^a1 = 'totally disagree', 2 = 'partly disagree', 3 = 'neither disagree nor agree', 4 = 'partly agree', and 5 = 'totally agree'.

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 the initiative 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 also to publish findings. We noted explicitly 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: (a) teachers' collaborations; (b) teachers' undertaking of professional learning activities; and (c) three motivational variables, these being 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.

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 analysed 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 for teachers to take the initiative when this was 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 their 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 between perceptions of formal and pragmatic distribution (MacBeath, 2005). In 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 in so doing, used pragmatic 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 with regard to the research question were connected to the findings.

Analysis of the questionnaire. With regard to 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 a 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 and Fidell, 2013). The dependent variables included collaboration, professional learning activities undertaken and the three motivational elements. The independent variable was the groups of principals with respect to 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 these 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, $n = 33$).

Results

Interview results

First, we classified the principals' responses into four categories: (a) principals who did not apply distributed leadership as a way of working in their school; (b) principals who partly applied

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

Interpretations	<i>n</i>	School leaders ^a
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)

^aNumber of years of experience of the principal is in parentheses; names of the principals are pseudonyms.

distributed leadership in their school; (c) principals who applied distributed leadership as a way of working in their school; and (d) 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 singled out principals who consciously granted space to teachers to take the initiative when 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 favour 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 years' experience)

Laurie's teachers took the initiative many times. 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 years' experience)

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 years' experience)

Of the 33 principals who said they applied distributed leadership, 11 mentioned formal leadership distribution. Because of their own desire 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 applied an organizational structure of teachers participating in subteams to this leadership perspective. Subteams worked on education- or organization-related subjects, which varied from organizing a school party, to searching for a new teaching method, to how students' results in, for example, maths, could be improved or how parents could be more involved in student learning. In all 27 schools, teachers were able to choose which subteams they would like to participate in. Within these schools, 10 principals (Jade, Britt, Alice, Tara, Esmay, Evelyn, Lenn, Rosanne, Nicholas and Dominic) nominated the chairperson of a subteam, and 8 of them gave the subteams an assignment including targets. In the other two cases, the subteams 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 subteam herself. In the other 16 schools, the subteams themselves selected the chairperson, as explained by Tess (7 years' experience):

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 apply an organizational structure of subteams to distributed leadership (Maud, Chloe and Joshua) were considering developing a new organizational structure. These three had only been active in their current school for a short time (one year, two years and one year, respectively). The interviews with the other three principals contained no supplementary questions with respect to subteams.

The five principals who partly applied distributed leadership in their schools did not require their teachers to take the initiative. 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 the initiative 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 accounted for not employing distributed leadership by saying that the team was not used to taking the initiative and assuming responsibility because of previous leadership practices.

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

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

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 indicated that they would like to

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

	Subscale	M	SD
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
	Experimentation	4.15	.63
	Reflection	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

M: mean value on a Likert scale that ranged from 1 = 'totally disagree' to 5 = 'totally agree'; SD: standard deviation.

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 years' experience)

In summary, for the 33 principals who reported consciously applying distributed leadership, differences in the interpretation of the concept arose. They took our description, which we shared with the principals before asking about their own interpretations and which strategy was emphasized, and then put forward their own meanings in relation to the concept of distributed leadership. Looking at their meanings, differences emerged in terms of the extent to which the principals granted space and responsibility to the teachers, and the extent to which they 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.

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 differed significantly 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, experimentation, reflection and job satisfaction (see Table 5).

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	.004
	Task interdependency	1,164.770	1,168.563	(143.611) .215	.645
	Collegial support	1,341.186	1,336.205	(156.103) 8.219	.006
Professional learning activities undertaken	Keeping up to date	1,346.148	1,348.032	(141.836) 1.977	.167
	Experimentation	1,257.936	1,258.240	(149.890) 3.734	.059
	Reflection	1,034.920	1,038.366	(142.891) .711	.404
	Sharing knowledge and experience	1,364.957	1,360.146	(167.154) 8.280	.005
	Internalizing school goals into personal goals	1,157.483	1,152.078	(144.597) 10.471	.002
Motivational variables	Sense of self-efficacy	1,135.134	1,134.611	(147.749) 2.195	.033
	Job satisfaction	1,250.712	1,153.204	(1,65.685) 0.135	.715

* $p < .05$. Significance 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 subvariables 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.

With regard to the motivational variables, the results showed that the extent to which teachers internalized school goals into personal goals ($b(SE) = .20(.06)$, $p = .002$, $\eta^2 = .003$) 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 it was possible to distinguish between strategic, pragmatic and formal distribution. That is, principals' interpretations of the distributed leadership concept varied from embracing teachers' decisions to change in a context of boundless space, to delegating principals' 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 subteams working on organization- or education-related subjects. We observed differences in how the subteams were organized and whether the chairperson was nominated by the principal 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 experience 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. The diversity in principals' perceptions of distributed leadership 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 a 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 understanding of this leadership perspective, which emphasizes employing informal leadership roles based on teachers' expertise and their affinity with a particular role (Harris, 2013; Spillane, 2012). The remaining principals distributed leadership roles not according to teachers' expertise but rather their own requirements, such as a need to be in control or share tasks. These principals' responses are in line with the work of MacBeath (2005), who integrated pragmatic and formal leadership into the concept of distributed leadership. Our findings confirm and add to the research of Harris and DeFlaminis (2016: 141), who argue that 'there should be some latitude to view it in alternative ways and to see it through different lenses'. Our findings indicated that scope for freedom of thought around distributed leadership is not a

hindrance, but may certainly have its benefits, as interpretations are related to specific practices and each variation seems to have an impact on teachers' collaboration, collegial support, the extent to which they share knowledge and experience and the extent to which they 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 in which the principal applies a distributed leadership perspective. In addition, 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, because teachers' involvement in leadership may enhance their self-efficacy, their 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 the initiative and assume responsibility for educational changes, their feelings of being respected may be positively affected. Such feelings appear to be essential in joint work and support (Amels et al., 2020). Joint work is the most intensive form of collaboration and involves focusing on reaching goals by employing 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 experimentation 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 took teachers' expertise into account 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 into 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, because the school leader's understanding of the context is important (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, experimentation and reflection). 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 experimentation and reflection 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 and 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 take account of teachers' capabilities and expertise by employing trust and a growth mindset and give space to teachers to take the initiative and assume responsibility, because such a working environment can contribute to realizing educational change.

Limitations and future directions

This exploratory study reveals limited evidence of the effects of distributed leadership on teachers' capacity to change (operationalized in terms of interpersonal, organizational and personal variables), because the effect sizes we found were small. However, a principal's leadership in itself is not enough to bring about change (Leithwood et al., 2010). For this reason, further research on how forms of distributed leadership can be effective in teachers realizing educational change is necessary. Furthermore, the way in which principals understand the school's context and needs is crucial in the relationship between distributing leadership and realizing change. In addition, the extent to which the influence of distributed practice is perceived needs to be judged over time (Day et al., 2016). The extent to which the principals were responsive to their context was not included in our interview questions, neither did we investigate principals' perceptions over time. These were limitations of this study. Therefore, follow-up research should be longitudinal and include information about the principals' responsiveness to the school 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. As a result, a congruence between the effect of patterns of leadership distribution on school goals and the expertise of those who are involved in leadership practices could be found.

The purpose of the interviews was to gain an 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 because 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. Further, 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), because these paths are related to the school 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, the findings of this study confirmed the results of a range of previous research, and the study's mixed methods approach enabled 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, all focused on realizing educational change.


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