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Under What Conditions Do Rural Schools Learn From their Partners? Exploring the Dynamics of Educational Infrastructure and Absorptive Capacity in Inter-Organisational Learning Leadership

Hilde Forfang[1]
PhD Candidate, Inland Norway University of Applied Sciences
Jan Merok Paulsen
Professor, Oslo Metropolitan University

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Abstract

This case study was designed to explore the strategies and actions that high performing schools with sustainable results employ at the district level in a rural part of Norway. The district subjected to the study is characterised by small municipalities and a scattered population, with a few small school administrative units, which might be a challenging context for sustainability and improvement. In response, the districts developed collaborative structures to increase collective learning capacity. The research design involved a collective case study, and it draws on data from interviews with school leaders at the municipal level and local school policy documents. The findings suggest that Norwegian school district actors can facilitate school improvement by shaping collaborating cultures, inter-organisational learning processes and educational infrastructures. Furthermore, the findings highlight the schools' ability to recognise and value new knowledge from external sources, such as academic institutions and partner schools, assimilate novelties across boundaries and, eventually, utilise these for strategic or operational ends to enhance an organisation's absorptive capacity. Finally, the findings indicate that superintendents can play important roles through boundary-spanning and gatekeeping activities.

Keywords: district leadership, school leadership, inter-organisational learning, capacity building, educational infrastructure.

Introduction

In the Norwegian primary school system, municipalities function as school districts and in many of them, the population is small. The current case study was designed to explore

[1] Corresponding author: hilde.forfang@inn.no

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the strategies and actions that high performing schools with sustainable results employ at the municipal level in a rural area in Norway. Today, there is broad consensus among policymakers, practitioners and researchers that the capacity of an educational system is one of the most decisive factors for the future of children and young people (OECD, 2013). At the same time, there are significant variations in a range of student achievements across regions and school districts in Norway and in most national systems (Hopkins, Spillane, Jakopovic, & Heaton, 2013; Steffensen, Ekren, Zachrisen, & Kirkebøen, 2017). According to Sigurðardóttir, Sigurðardóttir, and Hansen (2018), it seems fair to assume that the capacity to provide leadership and support varies greatly among municipalities, especially in terms of professional development and improving teaching and learning (Sigurðardóttir et al., 2018, p. 67). This case study aims to investigate how consistently high performing school districts enable schools to develop and improve by shaping learning processes, external collaboration and learning infrastructures (Leithwood & Louis, 2012; Spillane, 2013). The underlying assumption presumes that it is possible to reduce unintended between-school variations through collaborative learning that involves local schools, their leaders and school owners situated in inter-organisational learning structures within a geographical region (see Langfeldt, 2015; Roald, 2012).

The evidence that has accumulated from more than two decades of research indicates that, to a large extent, higher-performing schools function as stronger collective learning systems (Louis & Murphy, 2017; Louis, Thomas, & Anderson, 2010; Schechter, 2008; Schechter & Mowafaq, 2013; Silins, Mulford, & Zarins, 2002). As learning organisations, these schools develop learning processes, strategies and structures, which strengthen their capacity to deal effectively with change in uncertain environments and to utilise their collective learning capacity in the interests of their students (Leithwood, 2000; Marks & Louis, 1999; Schechter & Asher, 2012). The current article follows this broad line of reasoning; thus, empirical findings are analysed through the lens of organisational learning theory (e.g. Crossan, Lane, & White, 1999; Crossan, Maurer, & White, 2011) supplemented by more recent theorising on educational infrastructure (Spillaine, 2013).

Contextual factors affecting the organisation of schools in rural areas

In line with OECD (2018), in this article, "rural schools" are defined as those in communities with fewer than 3000 people. Reviews and international assessments highlight that rural schools differ significantly in terms of their structure, student composition and socio-economic context (OECD, 2018). The three neighbouring municipalities (the triad) selected for this study are situated in a rural part of Norway that is characterised by small municipalities and a scattered population. In total, the triad consists of approximately 1200 students nested in 10 primary or lower secondary schools, 160 teachers and 13 school leaders (principals and deputies). Owing to the scattered settlement pattern, the

sizes of the schools differ significantly. There are small schools with mixed-age classes and larger secondary schools with 400 students. At the regional or county level, the educational outcomes of primary and secondary education have been below national standards for a period of several decades (Directorate for Education and Training, 2017; Statistics Norway, 2017). However, the municipalities selected for this study have consistently increased their levels of student learning achievements in a sustainable manner, resulting in an above-average school profile. Analyses of the parents' educational level only show minor differences between the county and triadic municipalities. In a study that estimated and presented indicators of school contribution (Steffensen et al., 2017), the triadic municipalities achieved results that matched or were above the national average.

Typically, the challenges often faced by small schools in rural areas include the lack of capacity at the municipal level to provide the schools with adequate support, the lack of staff, time or experience to apply for central grants, difficult conditions for teacher recruitment and the risk of professional isolation and limited access to professional resources (Echazarra & Radinger, 2019; OECD, 2018). Therefore, creating professional opportunities and providing supportive working conditions in rural schools requires specific investments and models (Echazarra & Radinger, 2019), e.g. for establishing and maintaining networks and teacher teams that provide opportunities to learn from one another's practice across schools and for building the leadership capacity required to establish support structures.

Theoretical framework

The lens of organisational learning

Although the concept of organisational learning has been used to coin different, although nested, theoretical phenomena over the last half a century, some common premises can be found in the literature (Crossan et al., 2011; Schechter, 2008; Schechter & Mowafaq, 2013). The first premise is that organisational learning embraces both cognition and action, in terms of the content (of what is learned collectively) and the processes leading to these learning outcomes; moreover, cognition affects action or behaviour, and vice versa (Edmondson, 2002). In the second premise, the processes of organisational learning are viewed as being multi-level, spanning the individual, group and organisational levels in organisations. Furthermore, the processes are cyclical, shaped like "spinning wheels" (Crossan et al., 1999). The third premise is that, in the 1980s, researchers inferred that the value of learning from other organisations in external environments had increased dramatically during the growth of globalisation (Cohen & Levinthal, 1990; Paulsen & Hjertø, 2014). In terms of an "ecology" of collaborative organisations, inter-organisational learning emerged as a supplemental, yet necessary, perspective in order to capture the full pic-

ture of how new learning was implemented in organisations (Easterby-Smith, Lyles, & Tsang, 2008; Levitt & March, 1988).

According to Schechter (2008), organisational learning has been modelled along two tracks. The first approach views organisational learning as a set of independent variables: the learning processes that are implemented to generate learning outcomes. The second approach views organisational learning as a dependent variable capturing the outcomes of the learning process: (a) through changes in organisational members' shared mental models of goals, desired actions, historical events, tacit assumptions, causal maps and strategies (Levitt & March, 1988) and (b) through behavioural outcomes. Building on the empirical modelling of Schecter's (2008) research on school organisations, the conceptual framework in the case study presented in this article stems from the learning process track, studying structural and social arrangements that promote learning. The framework is shown in Table 1 below.

Table 1: Organisational learning processes in schools

Process	**Description**
Analysing professional information	• Teachers work together to plan activities. • Teachers work together to improve instruction. • Discussion group meetings are held to deliberate on professional issues.
Storing, retrieving and using information	• Instruction methods are modified on the basis of analysis. • Academic resources and research are shared in a common resource room. • Staff meetings are held to make decisions with reference to the decisions made in previous meetings.
Receiving and disseminating professional information	• Reports on innovation and change are circulated. • Research articles and reports are received and circulated. • Periodic evaluation reports are circulated.
Searching for solutions internally and externally	• Teachers observe their colleagues' lessons for learning purposes. • There are professional learning networks with other schools.

Source: adapted from Schechter, 2008

To search for new solutions among partner organisations within a school district system, it is essential to recognise and value new knowledge from external sources, assimilate it across boundaries and eventually utilise it for strategic or operational ends. This ability is conceptualised as an organisation's absorptive capacity (Cohen & Levinthal, 1990). The theoretical argument finds resonance in research on public schools in the United States that was conducted by Marks and Louis (1999); that study found that a school's organisational learning capacity—here synonymous with absorptive capacity—

predicted high levels of student achievement. In strict theoretical terms, absorptive capacity is conceived of as a meta-routine; thus it is an overarching organisational framework that helps employees share their experiences, knowledge and ideas, and challenge existing understanding through fresh knowledge (Lewin, Massini, & Peeters, 2011). Cross-functional forums and individual boundary-spanning and facilitation roles are important building blocks for this meta-routine (Paulsen & Hjertø, 2014). Most of the extant research has identified a positive relationship between various facets of absorptive capacity and knowledge transfer across external boundaries (Easterby-Smith et al., 2008; McIver, Lengnick-Hall, Lengnick-Hall, & Ramachandran, 2013). A study of professional learning among primary school teachers in Finnish schools suggested that organisational learning is notably both an inward- and outward-looking process: teachers' learning engagement with their day-to-day colleagues promoted their organisational commitment, whereas engagement in networks with external colleagues supported their sense of efficacy (Hjertø, Paulsen, & Thiveräinen, 2014). Organisational commitment refers to teachers' loyalty and social bonding with students, colleagues and their school, which are important compensation mechanisms in cases where structural couplings are relatively loose (Meyer & Rowan, 1977). Teachers' cognitive sense of efficacy refers to their belief that they are capable of affecting their colleagues' choices and behaviours, and their schools' strategies.

Educational infrastructure

For a single school, mastering the relationship between structure and innovative learning is at the heart of developing a more integrative organisation (Paulsen, 2019). However, the relationship between exploratory learning and organisational structural forms is inherently uncomfortable—it is tense, rather than fluid (March, 1991). No doubt, a structural form is important for improving schools, and although the relationship is significant, it is not clear-cut, because learning and improvement require both change and stability (Marks & Louis, 1999). Marks and Louis (1999) have noted the following impediments to organisational improvements:

> Limited and fragmented structures for coordinating activities within the school and between school and community, low interdependence in teaching roles, and formal decision-making processes that are viewed as unfair or arbitrary by many participants (p. 713).

While a systemic organisation undergirded by organisational routines and formal roles promotes student learning, the same structural elements may also inhibit exploration and risk-taking, which are important for innovation (March, 1991).

In the practice of leading teaching, school leaders meet classroom teaching; therefore, teaching has to be the focal point of any leadership approach (Spillane, 2013). Municipal and school infrastructures comprise the formal structures and resources used to shape

practice by supporting teaching and enabling improvement (Hopkins et al., 2013). Educational infrastructure includes the instruments and tools of instruction, formal positions, routines and procedures that guide work, professional norms and values and the cognitive scripts embedded in work (Spillane, Hopkins, & Sweet, 2018). Designing a structure that works continues to be a central challenge in organisations; it likely persists because infrastructure is often taken for granted and overlooked (Hopkins et al., 2013). The expectations school owners have for a school and the students' learning outcomes will affect the organisation's infrastructure. To ensure that school leadership has a positive impact on students' learning, the structure has to be designed as an infrastructure for the leadership of learning (Spillane, 2013). Hence, the different components have to be geared towards supporting the school's core mission, so that the various components in the infrastructure contribute to the students' learning and the school's results (Roald, Andreassen, & Ekholm, 2012). Spillane (2013) has reported on the ways in which teaching has been loosely coupled or decoupled from the school's infrastructure. However, infrastructure has a significant impact on creating the support for teachers' professional learning that promotes changes in their' practices and beliefs (Shirrell, Hopkins, & Spillane, 2019).

Spanning boundaries in a loosely coupled school governance system

The Norwegian school governance system can be understood as both a tightly and loosely coupled system across multiple levels (Paulsen & Høyer, 2016). The view of education systems as tightly coupled implies a government model in which school administrators at higher levels of the system have policies that control schools, and the higher-ranked administrators feel confident that school leaders and teachers will implement decisions in practice (Weick, 1982). In contrast, the conception of school systems as loosely coupled acknowledges that school governance occurs in multi-level systems that entail many broken chains (Paulsen, Johansson, Nihlfors, Moos, & Risku, 2014). The crucial point is that some lack of correspondence can be expected between the formal organisational system architecture, in terms of plans, goals, strategies and routines developed by state agencies, and the negotiations, decisions, power distribution and operational activities carried out by the players in the municipalities. Weick (2001) defined loose coupling as evident in a multi-level organisational system:

> …when the components of a system affect each other: first, suddenly rather than continuously; second, occasionally rather than constantly; third, negligibly rather than significantly; fourth, indirectly rather than directly and fifth, eventually rather than immediately (p. 383).

Weick (1976) has made an important, but overlooked, point that loose coupling is a dialectical phenomenon because organisational systems are typically both loosely and tightly coupled, yet in different areas of the policy chain. In line with the loosely coupled system theory, it can be expected that municipal school superintendents actively mediate

reform signals and expectations from different parts of the governance chain in order to create the best possible match with the local schools' cultures. Thus, it is possible that superintendents employ different strategies to balance the complex blend of demands for professional trust among teachers and school leaders, the local autonomy expected by local politicians and the legitimised state control imposed on them through the quality assurance system.

Moreover, a study of Norwegian superintendents concluded that they were active players in several professional networks, and, by definition, they worked as boundary spanners (Moos, Nihlfors, & Paulsen, 2016). The concept of as boundary spanners refers to individual agents who, in their daily work, cross internal and external organisational boundaries. As boundary spanners, school superintendents in Norwegian municipal school systems: a) interact directly with schools, b) set agendas for and participate in school board meetings, c) are members of senior management teams and d) interact regularly with peer superintendents in other municipalities (Paulsen & Høyer, 2016). Boundary-spanning individuals can play an important role in the internal dissemination of information, knowledge and ideas across organisational boundaries. Boundary spanning also encompasses externally-oriented activities, such as scanning, mapping and constructing a picture of the environment, including predicting future trouble spots or potential allies (Daft & Weick, 2001). A nested concept, gatekeeper, is used to describe individual players who are in a position of power to select what kind of information and initiative that are set on the agenda (Paulsen, 2014). An important conceptual nuance is that the agents are bound to the same social system—for example, the education sector in a municipality—and the ties between the gatekeeper and the other members are formalised. By utilising the gatekeeper position, superintendents can decide that some input issues or currents can be excluded (door shut), while others can be admitted (door open) (Paulsen, 2014). This form of selection is important for organisational learning because the gatekeeper identifies relevant information, determines what is considered to be the most pertinent and then puts it on the agenda for the staff members. It has also been demonstrated that, in ethical and value-based aspects of school administration, gatekeeping is an important feature because unwanted items that violate the standards of a professional group or an organisation's values are excluded (Paulsen, 2019).

Complementary to gatekeeping, a recent study pointed to a collaborative and trust-based group climate in the municipal school leadership team as a productive coupling mechanism (Paulsen & Hjertø, 2019). Specifically, when school leaders perceive that, in the group of leadership colleagues headed by the superintendent, there is a shared sense of a "risk-free zone" where it is possible to voice one's concerns, the propensity for sharing knowledge with colleagues increases significantly (Paulsen & Henriksen, 2017). In a similar vein, the school principals' shared belief that their superintendent was trustworthy (the superintendent's behaviours are associated with benevolence, honesty, integrity and authenticity) was positively correlated to collegial learning in the group of school leaders (Paulsen & Hjertø, 2019).

Methods

Case sampling

The empirical basis of this article is a theory-based collective case study (Stake, 1995) located within a larger research and development project that aimed to increase students' learning achievement in primary and lower secondary schools in a county in Norway. The present study aimed to explore the strategies and actions employed by school owners at the municipal level in a rural area in schools with high performing results, over time. The municipalities were selected based on data from the School Portal, a web-based portal for providing schools and school owners with relevant and reliable data about primary and secondary education in Norway (Directorate for Education and Training, 2017). In this article, the high performance of school results over time is defined as the results in reading, mathematics, English and well-being that are better than or equal to the national and county average for the last five years, or more. In one rural area, the performance of schools in three neighbouring municipalities was higher than that of the schools in the other municipalities in the county, demonstrating results that matched or exceeded the county and national average over the past decade.

Data collection

Interviews

To recruit informants at the school owner level, we contacted the municipal directors. Three representatives of the municipal school owner level, one from each of the triadic municipalities, attended the interviews. In order to generate rich descriptions of the strategies and actions at the municipal level, an individual semi-structured interview was the preferred approach. The first author conducted the interviews in February 2017. The interviews lasted about one hour, and they took place in the school owner's offices. The interview guide was organised thematically around questions based on previous research concerning improving student achievement, school leadership and municipal governance (DuFour & Marzano, 2011; Leithwood & Louis, 2012; Louis, 2015; Roald et al., 2012). The interviews were recorded and transcribed with an emphasis on verbatim translation.

Documents

The information in the documents was used to strengthen the data and evidence obtained from the interviews (Yin, 2014) and to provide insight into the phenomena that the school owners may have forgotten or may not have wanted to illuminate (Creswell & Creswell, 2018; Merriam, 1998). Through the informants and the municipalities' websites, we accessed several interesting documents. We found political strategy plans, development- and competence plans, agreement documents and status reports relevant for the analysis. While the documents are not cited by their titles, they have been assigned pseudonyms,

Document 1, Document 2. etc. This choice was made to avoid compromising the anonymity of the triadic municipalities.

Data analysis

In the preliminary phase, relevant pages and paragraphs from the documents and statements from the interviews were marked, and descriptive codes were identified. The questions in the interview guide were used to systemise and reduce the material into manageable units of data (Kvale & Brinkmann, 2015; Miles & Huberman, 1994). Then, the materials were subjected to within-case analysis and cross-case analysis (Miles & Huberman, 1994; Miles, Huberman, & Saldaña, 2014; Stake, 2006), as seen in Table 2. The findings were analysed through the lens of organisational learning theory supplemented by more recent theorising on educational infrastructure, focusing on instruments and tools of instruction, formal positions**,** routines, procedures and professional norms and values (Spillane, 2013). The purpose of this study was not to identify individual variations, but rather to elicit and describe those aspects of the structures and strategies that are common within the triadic municipalities. To accomplish this, we first had to identify what was unique about each individual municipality and then compare it across the municipalities to build "abstractions across the cases" (Merriam, 1998, p. 195).

Table 2: Matrix for the cross-case analysis

	Merged findings	**Municipality**
Instruments and tools of instruction		
Merged finding I	Network at all levels	1,2,3
Merged finding II	Network across schools and municipalities	1,2,3
Merged finding III	Analytical model for educational challenges	1,2,3
Merged finding IV	Joint workshops at all levels	1,2,3
Merged finding V	Data- and research-based approach	1,2,3
Formal positions, routines, procedures		
Merged findings I	Two-level municipal organisation	1,2
Merged finding II	Triadic agreement since 2010	1,2,3
Merged finding III	Regional network since 1990	1,2,3
Merged finding IV	Co-location of financial resources	1,2,3
Merged finding VI	The superintendents' roles and authority	1,2,3
Merged finding VII	Educational Psychological Service, inter-municipal	1,2,3
Merged finding VIII	Collaboration with universities and research institutes	1,2,3
Professional norms and values		
Merged finding I	Collaboration is necessary	1,2,3

Merged finding II	Mindset adapted education and special education	1,2,3
Merged finding III	Formal and informal (trust-based) agreements and collaboration	1,2,3

Source: (adapted from Stake, 2006, p. 59)

Findings

The building blocks of educational infrastructure

The interview data and strategy documents portray a clear path dependency embedded in a collaborative culture. First, since the beginning of the 1990s, the municipal triad selected for this study has been part of a regional network consisting of six municipalities with common strategies for school improvement and professional development. The school owners stated that this network was founded before the municipalities were restructured into a two-level system that led to a downgrading of educational competence and the removal of the superintendents and the central school office. Furthermore, they indicated that the former superintendents, based on their knowledge and experience, understood that small municipalities had to collaborate to offer professional development, continuous education and training to teachers and school leaders in the region. This is also stated in several of the strategy documents, for example:

> There is a strong consensus and belief that we have to meet the challenges of the region in common. It requires broad and binding cooperation (Document 3, p. 3).

Second, the school owners emphasised the importance of the co-location of financial resources. Through a committed agreement, the network of six municipalities decided to transfer and co-locate state grants and local funding into one municipality. At the same time, the authority to manage and coordinate the resources was delegated to the superintendent of the same municipality. This enabled the network of six municipalities to apply and implement multiple local- and nationally-initiated projects, over the past several decades. Many teachers and school leaders have also pursued continuing education. During the interview one of the school owners explained:

> This agreement has led to the availability of funds. The economy has not been a limiting factor in implementing measures and strategies for school improvement. In addition, we have had financial resources to continue the work even after the national projects ended. You know that is when schools really are ready to start working on it, so because of the pool of resources the project has been going on for three or four years.

Third, in 2010, the city councils of the triad signed a formal cooperation agreement concerning educational qualifications and services. This agreement was related to a new provision in the Education Act, which stated that "the municipal administration shall have employees above the level of the school with educational qualifications". The two-level

structured municipalities that no longer had a municipal education department had difficulty fulfilling these legal requirements. During the interviews, the school owners explained that the economic frame conditions did not allow the reinstatement of a superintendent in each municipality. Instead, the two-level structured municipalities decided to buy educational qualifications and services from the triadic municipality that had a superintendent with educational staff. According to an agreement document, in 2010 the triad agreed on the allocation of costs and the delegation of authority. Since then, the triad has engaged in contractual cooperation in terms of educational qualifications and services. One of the school owners described the cooperation as follows:

> We have been very fortunate in this collaboration; there have been highly competent persons, continuity and a lot of expertise. For me as the top leader of the schools, the agreement has been invaluable given that the municipality is organised in a two-level structure.

While the network of six municipalities has mainly focused on continued education and school development, the triad's formal agreement has also focused on the school owners' duties and responsibilities in terms of quality assurance in accordance with legislation, regulations and management documents.

Fourth, the Educational Psychological Service (EPS) systemic work and its role in the competence development and guidance of teachers were emphasised during the interviews. The EPS is organised as an inter-municipal service. In the late 1990s, the network of municipalities decided to allocate resources to a full-time EPS supervisor to guide the teachers in implementing preventive strategies to address students' reading and writing difficulties. The document analysis findings show that today, the EPS mostly focuses on workshops, training and guidance for teachers, and it has competent teams dealing with students' mathematical difficulties, language difficulties, multilingualism, social and emotional difficulties and complex learning difficulties. According to one of the school owners, EPS seems to be an important part of the infrastructure:

> Moreover, much has been started, led and carried out by the EPS. Therefore, perhaps that is some of the reason why we still are working together well in this region.

Inter-organisational learning

Analyses of the triad's framework for professional development clearly indicated that networking is a widely used approach at all levels of the school system. There are established networks for school leaders, English teachers, teachers working in schools with mixed-age classes and networks linked to different topics in national and local development projects, as well as networks for school leaders. The school owners stated that the networks are managed by resource personnel in the local environment or adept teachers, which provides an opportunity for knowledge transfer across schools and municipal boundaries. According to the data that emerged from the documents and the interviews,

established structures at both the school owner and school level contribute to regular discussions about the obtained data against key goals.

> Systematic work at the schools, with an emphasis on early interventions and adapted training, is important for keeping the proportion of special education at the lowest possible level (Document 4, p. 10).

An example of this is the decline in the number of students receiving special education. One of the school owners explained that the decline was a result of a process towards achieving a common mindset on the concept of normality.

> There is a clear strategy, a data-driven strategy, in which the superintendent in dialogue meetings with the school leaders raises and analyses challenges related to ordinary adapted education and special education.

In relation to the county research and development project, work in collaborative teams encompasses the use of data, research-based texts for analysis and critical reflection. Based on the challenges associated with self-instruction, teachers in collaborative teams use research-based texts and collegial observation for analysis and critical reflection to improve existing classroom instruction methods or obtain new methods. The triadic school owners seemed to prioritise joint workshops for teachers, courses related to prioritised subjects or target topics and focus areas for school development. The documents also indicate systematic use of external collaboration with universities and research institutes.

The superintendent's role in boundary spanning and gatekeeping

Analysis of the documents provided helpful insight into the superintendent's assignments and responsibilities. The superintendent is responsible for the schools in his or her own municipality; he/she also leads the formal cooperation between the municipalities in the triad and coordinates the professional and joint school development projects in the network of six municipalities. Furthermore, the superintendent is responsible for inter-municipal adult education and is the chief adviser for the inter-municipal EPS. Moreover, the superintendent coordinates oral exams, which are a collaboration with municipalities that are located outside the county. Finally, the superintendent is the common link to the County Governor, Education Directorate and the Norwegian Association of Local and Regional Authorities (Document 2). Through the interviews with the school owners, it became clear that the superintendents expressed a strong commitment to the triad and the network of six municipalities:

> In relation to one's own municipality, it may be possible that the superintendent prioritises the region too much, but that has been important. It has also been important for where we stand today.

For decades, the position of the superintendent has had extensive authority, and it has served several important roles in both the triad and the network of six municipalities. A Cooperation Agreement formalised the superintendent's authority and responsibilities.

> The superintendent is responsible for joint workshops, networks, partnerships, the adoption of common areas for school development and for guiding and supporting school leaders. The superintendent is assigned the authority to organise regular meetings for the school leaders in the triad and the network of six municipalities, as well as meetings between the municipal directors, school leaders and the superintendent (Document 3, p. 1).

Discussion

The findings in our study cluster and cohere around a systemic perspective on school improvement in regional and rural district settings. First, the triadic educational infrastructure, supported politically and administratively from the apex of the three municipalities, establishes a contractual arrangement that enables the involved school leaders and their teachers to share limited learning resources across hierarchical boundaries. The implicit theoretical point shows the significance of hierarchical power, in this case, exerted by the sector administrators, for initiating and sustaining structures established to support organisational learning (Crossan et al., 2011). Second, the shared goals for school improvement, negotiated among the professionals of the municipalities, can be linked to learning activities through joint inter-organisational meetings and workshops in specific subject-based teacher networks. The latter point underscores the importance of cross-functional and inter-organisational venues to effectively share the experiences that are to be supported, as suggested by previous studies (Aas & Paulsen, 2019; Paulsen & Hjertø, 2014). More specific to the case discussed in this article, networks and workshops enable teachers to modify the principles for instruction and student assessment based on the sharing of experiences and the assimilation of research-based knowledge provided by a research centre (Schechter & Mowafaq, 2013). Third, these inter-organisational venues enabled school leaders and teachers to improve their capacity to analyse information related to student achievements in a way that supports instructional improvements, which is highlighted as a central organisational learning mechanism in schools (see Schechter, 2008).

Implications for theory building and further research

Educational infrastructure

In a theoretical sense, the building blocks of this locally created system—that is, the evolving learning structures, learning routines and shared a commitment to collaborative learning among school professionals—are connected through several elements in local educational infrastructure (Spillane, 2013; Spillane et al., 2018). In the case study pre-

sented in this article, a designed educational infrastructure was grounded on binding contractual obligations among the municipalities: network structures for prioritised learning activities and shared systems/structures for data use and teacher teamwork.

Absorptive capacity

In order to maintain a local system that creates innovations through inter-organisational learning, existing research on non-educational (Lewin et al., 2011) and educational organisations (Paulsen & Hjertø, 2014; Farrell, Coburn, & Chong, 2018) has suggested that the ability to absorb external knowledge is a key factor for forming and sustaining effective organisational learning processes. In the case study, this theoretical point was embodied in the long-term partnerships with universities and research institutes paired with a systematic approach in practice to inter-municipality collaboration in workshops and networks that span municipality and departmental boundaries. Thus, we see the co-existence of an educational infrastructure that crosses municipality and school boundaries, paired with the systematic building of absorptive capacity, as a promising path for further empirical exploration.

Organisational learning mechanisms

In the present case, inter-organisational learning highlights three key cyclical processes: the sharing of learning resources in the triad, the relatively rapid transfer of new knowledge across school and municipality boundaries, paired with local adaptation, and the sustainable team learning processes in teacher groups (see Crossan et al., 1999; Crossan et al., 2011). Throughout the entire triadic system, teachers work in teams, where the mandate demands that they work collaboratively with the challenges associated with their own instructional practices (Edmondson, 2002; Hjertø et al., 2014). The methodologies demanded for teamwork encompass the use of research-based texts for analysis and critical reflection, joint reflection on the team members' own instruction, problem-solving in teams based on collegial observation and trial-and-error efforts related to new working methods. The group learning processes enacted in inter-municipality settings emerges as an interesting avenue for further in-depth study in future research.

Implications for school district policy and practice

Possible innovations for the school leaders in this type of system, as identified in this case study, encompass analytical models for data use backed by tailored methods for how to use various school performance indicators, such as student achievement profiles, school environment indicators and feedback survey information from teachers and parents for school improvement purposes. Other possible innovations identified in this study include more widely-shared expertise for dealing with complex special education issues and the shared use of the resources possessed by expert teachers. Norway consists of many small municipalities situated in rural areas with limited capacity in terms of few and small

school administrative units that are located far from urban universities. Moreover, we see this combination as a promising path for practice development in rural regions.

Individual agents, such as school superintendents and school leaders, play important roles in fostering learning capacity through boundary spanning and gatekeeping activities to protect professionals from being negatively impacted by too much external disturbance. The purpose of boundary spanning is to support the influx of new knowledge—that is, variation as generative learning. Gatekeeping refers to the selection and restriction of what projects and initiatives should be supported with time, attention and funding. The findings in this case study indicate that superintendents can play this role by design and purpose, as facilitation of organisational learning is paired with power in the selection of gatekeepers (Paulsen, 2019).

Limitations

This study has several limitations. The findings are based on internal strategy documents and on self-reported practice shared during interviews with key actors (school owners), not on observed practice. Moreover, the case study links multiple data sources collected at different points of time, and the results of the present study might have been influenced by the special characteristics of the local context. However, the study does provide a picture of how school owners in a high performing rural area can increase the quality of teaching practice, as well as how these factors interact with learning cultures and organisational infrastructures. In future research, a larger sample representing various geographic areas, preferably including other countries, is highly recommended.

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