School Leadership in Innovative Work

Places and Spaces

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Summary

This study investigates school leadership in innovative work in the context of school development processes in Norway. The aim of the study is to develop new insight into the complexities involved and the functions of leadership in this kind of work. The empirical context for the study is school development processes involving ICT. Specifically, the study examined two different development projects, analysing the work performed in the leadership teams responsible for running the projects. The data used for the analysis were drawn from the interactions that occurred in the team meetings. Using the third generation of cultural-historical activity theory (CHAT), the study examines innovative work as an interactional process through which newness is actualized and leads small-scale changes. Leadership is studied as the regulation and coordination that take place in the interactions consequential to the directions and outcomes produced. The study shows how development work is rendered innovative when pluralities of perspectives are externalized in team discussions oriented towards problems arising in the work. However, such innovation is conditional on the participants taking the lead in pursuing perspectives that become mediating resources and promoting actions that break away from the cultural-historical formation of work. The study shows that leadership in innovative work is constituted in the interplay between the hierarchical and distributed dimensions of agency and authority. The study also shows that leadership is not under the control of any of the involved actors or of any specific individuals. Instead, leadership emerges in grids of relations that are constituted and changed through group interactions driven by a myriad of motives and tensions. Based on these findings, the study discusses challenges of leadership functions in innovative work and their implications for leadership. Specifically, it explores how these challenges relate to dealing with complex problems and facilitating conditions for innovative work and how they require leadership to be concerned with organizing spaces in which potential new ways of working can be experimented with in a structured way. To gain further insight into leadership in innovative work, future research needs to take the emerging school development processes in places and spaces as the departure point for its analysis.

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PART I:
EXTENDED ABSTRACT

1 Introduction

Schooling quality is currently an urgent political issue in many countries. International league tables, an expansive global economy, technological innovations and rhetoric about the ‘knowledge society’ or ‘information society’ have combined to create a compelling drive to bring about changes within schools and school systems in order to improve teaching and student learning (Hargreaves & Fink, 2006). The outcomes of this global quest for excellence include educational reforms (Sahlberg, 2010) and the expectation of the core activity of schooling becoming more effective and productive through the continuous development and implementation of innovative practices and tools (Hargreaves & Shirle 2008; Cuban, 2007). This thesis explores leadership in innovative work in the context of school development processes in Norway.

Both in policy (eg., Norwegian Ministry of Education, 2004; OECD, 2008, 2013) and in educational change research, leadership is considered essential to managing school development work and sustaining change (e.g., Aas, 2009; Emstad, 2012; Fullan, 2006; Hargreaves and Fink, 2006; Harris, 2010; Helstad, 2013; Leithwood, Harris, & Hopkins, 2008; Leithwood, Mascall, & Strauss, 2009; Roald, 2010). However, both leadership and developmental work are complex and contested terms. The ways in which these terms are used and understood varies, and the relationship between them is often conceptually indistinct. In Norwegian research on educational change, the *school development* tradition is strong, and terms like development, improvement, learning, quality, change and reform work are among the most commonly used in examinations of how educational change is brought about; innovation, in contrast, is rarely used (Erstad, 2005)¹. However, in this thesis, which focuses explicitly on the actualization of newness in terms of whether and how ideas and tools that may be consequential to educational practices are generated, I have chosen to use the term innovation.

In the vast and substantial body of international research educational change conducted in the strands of school effectiveness and school improvement research², which the Norwegian school development tradition can be related to (see, for example, Aas, 2009; Hovdenak, 2009;

¹ In the Norwegian context, the term was used by researcher Per Dalin (1936-2010).

Møller, 2006), the above-mentioned terms related to the examination of educational change, including innovation, are used. In the research field, there is a long tradition of investigating the success or failure of innovations and of demonstrating the significance of leadership in making innovations successful (see, for example, Berman & McLaughlin, 1978; Bossert, Dwyer, Rowan & Lee; Brigdes, 1982; Fullan, 1997b, 2001; Harris, 2009). A main concern has been to figure out what designated leaders *do* or *should do* to become successful in their management of innovations—a study that has often debouched into guidelines and recipes. Although the knowledge base within the field is substantial and has contributed important knowledge to policy, practice and research, it also gives rise to some problems that need to be questioned. The assumptions that formal leaders are bestowed with the capacity to manage change and that there are (or, at least, may be) one ‘successful way’ of doing so is often implicit. However, the literature has repeatedly confirmed that work aimed to change teaching and learning practices is complex, ambiguous and contested. Leadership in ‘the making of newness’ is, notably, embedded in and contingent upon schools as places with high complexities, in which persons and institutions negotiate goals and achievements (e.g., Blasé, 1998; Blase & Björk, 2010; Hoyle & Wallace, 2005; Murphy, 1991; Olson, 2003).

In this respect, there is (perhaps foremost) a need for research suggesting that leadership in innovative work does not exist in a social vacuum; rather, leadership is an organizational feature that emerges through work on the complexity of relations among the individuals, collectives and the issues at stake. This question has motivated and guided the design and development of this thesis. From this point of view, leadership can be regarded as *an outcome* of innovative work, with consequences for directions produced, rather than *a cause* of certain individuals or groups, as reflected in the knowledge base referred to above.

Consequently, to enrich our knowledge about leadership in work processes through which ‘newness’ emerges, there is a need for increased engagement in research that takes into account the work-embedded interactional aspects of leadership—which are the concern in this thesis.

1.1 Aims and research questions

The overall purpose of this thesis is to gain an enriched understanding of leadership in innovative work in the context of school developmental processes. Its aim is to develop new insight into the complex relations involved in the leadership in innovative work and to shed

light on and discuss the functions of leadership in this kind of work. To meet this aim, I have accessed various *school development processes*, within which practitioners have worked purposefully to improve teaching and learning by creating new tools and integrating them into on-going practices. I assumed work processes involving the development and integration of information and communication technologies (ICT) to represent a ‘good entrance’ into this kind of work, since the uptake and use of ICT in teaching and learning presents complex opportunities and challenges for schools that implement innovations. To pursue overall purpose and aim of the thesis, I examine:

How innovative work is brought into being in the context of school development processes involving ICT and the constitution and functions of leadership in this kind of work.

The term *functions of leadership* refers to the ways in which leadership is enacted and becomes consequential to the directions and outcomes produced in situated work activities. Taking the work performed in project leadership teams³ responsible for running school development processes in Norwegian schools as a point of departure for the analysis, the following sub-questions are addressed across the articles:

- 1) How is innovative work brought into being when project teams work on problems emanating from school development processes?
- 2) How are initiatives, agency and authority played out, legitimized and consolidated when project teams work on problems emanating from school development processes?
- 3) How is leadership enacted when project teams are engaged in problems related to innovative work in the context of school development processes?

With focus placed on the project teams’ work conducted in meetings, the first article is concerned with how such work becomes innovative in the sense of producing new ideas and resolutions to problems facing the participants. The second article is concerned with how leadership is constituted in this kind of work. The third article is concerned with how leadership is enacted when project teams are engaged with problems of innovative work, with a particular focus on the functions of leadership in this kind of work. Figure 1 shows the relation between these three articles and their contribution to the overall purpose of the thesis.

³ ‘The project leadership teams’ are for short hereafter referred to as ‘the project teams’.

Figure 1: The relation between the three articles included in the thesis and their contribution to its main purpose

1.2 The theoretical and empirical grounding of the thesis

Research on leadership, as it pertains to innovation in education, is multi-faceted in its approaches and in its objects of inquiry, reflecting variables such as complexity, fluctuating educational policies, and changing times and contexts. A central aim of research is to enrich our understanding of the complex relations involved in leadership as it pertains to innovation; however, what counts as evidence both inside the communities of researchers and in the practices concerned (e.g., leadership education, schools and school systems, and policy making) fluctuates (Florio-Ruane, 2002). Our chosen approaches ultimately depend on *ontological and epistemological* issues: what we understand to be leadership and innovation, the connection between them and how we can know anything about their related issues. These issues guide the questions we ask, as well as our interpretations of empirical evidence.

By placing emphasis on leadership as an *emerging constituent of work activities* in the research question of this thesis, implies a theoretical position. In this thesis the analysis of leadership in innovative work is theoretically informed by the third generation of cultural-historical activity theory (CHAT) developed by Engeström (1987). A particular strength of CHAT is provided in the thorough explanations of how work activities evolve and how organizational phenomena, such as leadership and innovation, emerge as integral parts of these

developments (Engeström 1987, 2005). From the perspective of CHAT, organizational phenomena are fundamentally social in origin and emerge from joint human actions and interactions, which are specific and anchored in cultural and historical roots. CHAT offers an explicit set of analytic concepts for studying organizational phenomena as *emerging* constituents of object-oriented activity, giving virtue to the understanding of the complex relations involved in their origin. Hence, a CHAT approach provides an opportunity to study in depth how leadership is constituted and enacted in the interplay of individuals, purposes and tools to the affordances and constraints of the context.

In CHAT, innovation is defined as ‘small-scale changes’ initiated and constructed by groups of persons who experiment with novel ideas (cf. Sannino & Nocon, 2008) that have the potential to develop into organization-wide transformation. What I see as innovative work—the topic explored in this thesis—is an interactional process through which the construction and actualization of newness may emerge and lead ‘small-scale change’. Leadership is studied as the regulation and coordination that takes place in social interaction and is comprised of work activities consequential to the directions produced.

The *three* articles included in this thesis have their empirical bases in two cases of school development projects in Norway: the Pinewood project and the Riverside project. Both projects took place in the context of the Norwegian Knowledge Promotion Reform, which was introduced in 2006 in primary, lower secondary and upper secondary education and training and was led by project teams composed of representatives of the actors involved.

The Pinewood project was a collaborative project among three schools in a municipality. The overall aim of the project was to develop ICT practices that could better cater to individual students’ needs. Its declared goal was to develop knowledge and exchange experiences related to the use of digital tools for adapted education, for the organization of everyday teaching and learning, for assessment work and for a cooperation between home and school. The project was based on the idea that improved digital tools and resources could enable the ambition of adapting education to all students and that such tools would increase the availability of learning resources to students, enable communication related to students’ work

between homes and schools, and facilitate differentiated teaching (as outlined in the project plan)⁴.

The Riverside project was organised as a collaborative project between three upper secondary schools and the business company Brinnerton, which provided the software, services and Internet technologies. Brinnerton is known as a frequent partner for school-based ICT projects. The aim of the common project for the three schools was to give teachers and students access to new software that could facilitate learning and help the students become better organized in their learning activities. The project was based on the idea that students could receive better exam results if the software was integrated and utilized in everyday teaching and learning (as outlined in a presentation of the project).

The rational for choosing these two cases was based on the fact that both schools already had regional or national reputations of being ‘innovative’ with regard to applying new digital technologies to work practices and of participating in wider partnerships to advance innovative work in education. Using such cases enabled me to gather rich data on the issues of leadership in innovative work in school development processes.

The theoretical grounding of this thesis will be outlined in more detail in Chapter 3, and more information about the empirical context is provided in Chapter 4, Section 4.2, and in appendices 1 and 2. An overview of the thesis is provided in Table 1, on the next page.

⁴ The Pinewood project plan and the presentation of the Riverside project referenced in the text are not included in the references due to privacy considerations.

Table 1: Overview of the thesis

The overall purpose and aim				
To gain an enriched understanding of leadership in innovative work in the context of school developmental processes, to develop new insight into the complex relations involved in leadership in innovative work, and to shed light on and discuss the functions of leadership in this kind of work.				
Theoretical framework				
Third generation of Cultural-Historical Activity Theory (CHAT)				
Empirical grounding				
Project teams responsible for running school development processes situated in two Norwegian school projects				
	Title	Research question	Core empirical data	Main findings
Article I	The emergence of innovative work in school development	How can school development work become innovative?	Interactional data from work conducted in planned meetings by the project team responsible for running the Riverside project	The study shows how innovative work is brought into being when pluralities of perspectives are externalised in a team's discussion, conditional on one or more of the participants taking the lead in pursuing a perspective that becomes a mediating resource, promoting actions that break away from the cultural-historical formation of work.
Article II	School leadership: constitution and distribution	How do initiatives emanate and become consequential for the progress of social activities? How are agency and authority displayed, legitimised and consolidated?	Interactional data from work conducted in planned meetings by the project team responsible for running one of the local school projects involved in the Pinewood project	The study shows that leadership emerges in complex chain of actions oriented by purposes constituted in the interplay of hierarchical and distributed dimensions of agency and authority.
Article III	Innovative work in school development: exploring leadership enactment	How is leadership enacted when project teams are engaged in innovative work?	Interactional data from work conducted in planned meetings by the two project teams responsible for running the Riverside and the Pinewood projects	The study shows that leadership is not under the control of any of the involved actors or any specific individual; that is, the center does not hold. Instead, leadership is enacted in grids of authority relations that are constituted, challenged and changed in interactions driven by a myriad of motives and tensions.

1.3 Outline of the thesis

The thesis is organized into two parts: 1) the extended abstract and 2) the three articles. To provide a benchmark for understanding the evolving research foci and the ongoing dialogues in the research field, as well as to develop a framework for establishing the importance of my study, in Chapter 2, I discuss and frame the evolving approaches that have been applied in research on leadership and innovation in the field of educational change during the last 40 years and draw together some key findings gained from these approaches. In Chapter 3, I explain the strengths and justify the use of CHAT as the theoretical foundation for achieving the thesis' aim and answering the research questions. In Chapter 4, I discuss methodological issues and justify the research design, the methods and the analytical approach used in the thesis. In addition, I reflect upon research trustworthiness and ethical considerations. In Chapter 5, I present a brief summary of the findings of the three articles. In Chapter 6, I discuss the findings in relation to the aims and research questions presented in this introduction and to the established research approaches and ongoing dialogues in the research field. In particular, challenges related to the functions of leadership in innovative work and their implications are discussed. Finally, I provide concluding remarks.

2 Innovation and leadership in research on educational change

This thesis, which aims to enrich our understanding of leadership in innovative work in the context of school development, belongs to the complex and diverse field of research on educational change. To situate this study, I have reviewed the key foci and approaches applied to innovation and leadership within the research field over the last 40 years and have drawn together some key findings emanating from its broad empirical research base. For the purpose of this overview, the review is divided into three historically evolving phases. These phases are not mutually exclusive; rather, they represent the turns and developments of the mainstream research perspectives and approaches on innovation and leadership in the research field. It should be noted that different approaches continue to exist through use in parallel or in combination (i.e., through the growing use of the mixed theoretical and methodological approaches that characterize much of the research work done within the field today) (cf. Hopkins, Stringfield, Harris, Stoll & Mackay, 2014). Such a review is not to be considered exhaustive; rather, it is meant to be merely representative, designed to ground the present study and argue for its contribution.

The review builds on the research literature on educational leadership and innovation published in international handbooks and review articles, together with empirical articles published in international peer-reviewed journals. The development of the review was explorative: First, I searched databases in Eric for international handbooks and state-of the art articles. Then, I used a version of ‘snowball sampling’ (cf. Neumerksi, 2013), following citations and research colleagues’ suggestions to examine published and presented empirical research in peer-reviewed journals to identify studies representing historical shifts and emerging perspectives.

Dividing the review into phases enabled me to develop a narrative of the evolution of the dominant foci, which appear to be based on and to run along similar approaches internationally. These foci originate in the U.S.—that is, in the approaches of school effectiveness and school improvement research⁵ that, in contemporary research, also seem to be

⁵ School effectiveness research is considered to utilize an outcome-oriented approach, traditionally focused on *what to change* to make organizational conditions of schooling more effective. In contrast, school improvement research is considered to use a process-oriented approach, which is focused on *how to change* organizational conditions of schooling to improve educational productivity aimed at offering guidance regarding affecting change

combined in various ways for different reasons (cf. Fink & Stoll, 2005; Hopkins et. al, 2014). In this study, I explore situated developmental work activities in order to gain an enriched understanding of leadership as it pertains to innovation aimed at enhancing students' learning and schooling outcomes. As such, my main concern lies with the work processes involved in school development, as well as with how newness and leadership emerge, take shape and become interrelated within such processes. Thus, I do not aim to identify or explain the causal relationships among leadership, innovation and outcomes. Instead, the review is restricted to and builds upon the research conducted within the distinct field of school improvement. In international research on school improvement, the notion of innovation has been used for decades. However, as mentioned in the introduction, in the tradition of school development in Norway (despite its building on the abovementioned approaches), the use of the term 'innovation' is rare.

In the following, I first present and discuss the dominant foci and approaches to *innovation* and *leadership* identified in empirical school improvement research from the early 1970s to the present. Then, I explore the knowledge gained from these approaches. Specifically, I examine how views of innovation and leadership have developed and how the conceptualizations and approaches in use have been critiqued. Based on this examination, I discuss how leadership, as it pertains to innovation, has been depicted in the reviewed research. Finally, I argue for the contribution of the present study.

2.1 Innovation in empirical school improvement research

In research on educational change from the 1970s to the present, there has been an increased emphasis on the significance of innovation for improving and making changes in education (cf. Hopkins et. al, 2014; Miles, 1998). It was in the 1970s that research on innovation and change in the distinct field of school improvement began in earnest (cf. Hopkins et al., 2014).

(cf. Fink & Stoll, 2005). School effectiveness research focuses on understanding the factors of 'what works' (i.e., at the pupil, classroom, school and context levels) that explain student outcomes. When carrying such findings over to the domain of school improvement, scholars tend to assume that the same factors that appear to explain educational productivity also function as the correct arrangements through which to improve educational productivity (cf. Slegers, Geijsel & van den Berg, 2002).

2.1.1 Innovation as adoption

In the early 1970s, innovation was seen as the *adoption of pre-packed knowledge and effective policy programs*, which were invented and spread across schools through temporary systems (e.g., project groups, workshops, research projects, consultative relationships, etc.) by individual adopters (Miles, 1998). From this perspective, innovations are designed and developed outside the school organization; they are ideas, products or technologies intended to be adopted and spread to improve the organizational conditions of schooling and the teaching and learning processes. Research during this period focused largely on practitioners' behaviours and skills. The aim was to understand the personal attributes conducive to the successful adoption of innovations and to develop formal, structural regulations to enhance those attributes through which successful adoption could be attained. Success was associated with the adoption of programs as-is (i.e., without changing them to suit the context of specific schools) (Berman, McLaughlin, Bass-Golod, Pauly & Zellman, 1977). This approach may be explained by the strong positivistic influence of behavioural psychology in the 1940s and 1950s (Miles, 1998). Through a variety of research (see, for example, Berman et. al 1977; Dalin, 1973; Miles, 1967, 1975; Schmuck & Miles, 1971), personal attributes and interpersonal skills, as well as the organizational structures conducive to the effective development and maintenance of such attributes and skills for the successful adoption of innovations, were identified. For instance, researchers reported management skills, as well as the fundamental skills of group behaviour (including joint problem solving, process analysis and self-analytic behaviour as forms of awareness, communication and evaluation, which can led to further diagnosis and action-taking), to be conducive to the effective uptake of innovations. Moreover, in both self-study and review, collaborations among involved actors, increased communication and staff training were emphasized as promising structural conditions for increasing the successful adoption of innovations in schools, as were temporary systems, change agents and external support.

Research during this phase illustrated that, although some individual attributes and interpersonal skills increased the likelihood of the efficient adoption of innovations, the effectiveness of the adoption of externally imposed innovations in schools was dependent, not only on individual mastery and structural regulations, but also on organizational conditions (e.g., Dalin, 1971, 1973; Miles & Schmuck, 1971; Sarason, 1971). Hence, the importance of focusing on the school as the unit of change, rather than on the individuals as change targets,

grew (cf. Miles, 1998). Moreover, the ‘adoption’ perspective inherent in the innovation-laden efforts of the 1970s was thrown into doubt by some very visible studies on implementation failure (e.g., Berman et. al, 1977; Gross, Giacquinta & Berstein, 1971; Smith & Keith, 1971). In its place grew the increasingly popular ‘implementation perspective’ of innovation (Lieberman, 1998; Miles, 1998).

2.1.2 Innovation as implementation and mutual adaptation

This shift in the focus of education improvement research in the mid-1970s did not change the view of innovation as *pre-packed knowledge* (i.e., something created outside of schools and then either selected by individual schools or imposed by local educational authorities or national reform initiatives). However, the implementation perspective did signal a view of innovation as an *extended process* rather than a *bounded event*, such as the decision to adopt (Miles, 1998). The substantial body of research that evolved during this phase was heavily influenced by model-theoretical approaches (e.g., Chin et al., 1970). On the basis of such models and their analysis of innovation, researchers promoted a range of perspectives on innovation and models of planned change (e.g., Berman et. al, 1977; Fullan, 1982, 2001b; Somekh et al., 1996). Despite differences in perspectives, however, these models of change relied on theories that assumed that innovations proceed through sequential processes, involving distinct and often linear stages of changes.⁶

Research during this phase was largely practitioner-oriented, in that it focused on practitioners’ concerns about the implementation of innovations to elicit information and on practitioners’ opinions of the factors perceived to affect successful mutual adaptation (Slegers, Geijsel &, van den Berg, 2002). This can be explained by the strong humanistic influence of phenomenological psychology, which penetrated social practice research in general and educational research in particular during this time. This interest in practitioners’ concerns regarding the implementation processes generated an array of studies (see, for example, Berman et. al, 1977; Fullan, 1982, 1991; Miles, 1975) that focused on the implementation stage of innovation. Mutual adaptation was the most common implementation outcome found to be associated with successful change. Mutual adaptation implied changes in implementer behaviours in the direction envisioned by the innovation’s developers and promoters, as well as

⁶ For example, according to Fullan’s problem-solving model, the stages of *initiation*, *adoption*, *implementation* and *institutionalization* are the four basic steps of an innovation’s progression (Fullan, 1982, 2001b).

changes in adaptations of the innovative program or practice in response to locally identified needs (cf. Berman et. al, 1977). I have identified two lines of research that existed during this period. The first, often referred to as first-order change, was concerned with the implementation of innovations in the core technologies (i.e., teaching and learning) of schools—related, for example, to changes in such educational products as curriculum content, program kits and practices. The other line, frequently referred to as second-order change, was concerned with how schools, as organizations, could support the successful implementation of innovations to their core technologies (cf. Cuban, 1988; Miles, 1998).

Research in the first line (see, for example, Hall & Loucks, 1977, 1978; Hall, Loucks, Rutherford, & Newlove, 1975; Leithwood 1981; Leithwood & Montgomery, 1982) reported, for example, that collaboration among teachers and teacher participation in local material development, problem-solving and decision-making were considered important in enhancing teachers' engagement with and commitment to teaching and professional development, as well as in reducing feelings of uncertainty about the benefits of innovations and teachers' roles in changing classroom practices through innovations. It was also argued that changes in teacher practices should be assessed as processes of behavioural change that progress incrementally towards conformance with images of successful innovation implementations supported by leadership, resources and technical assistance.

A debate among researchers concerning the focus on first-order change and the lack of sensitivity to how schools, as organizations, could impact the implementation of innovations (cf. Miles, 1998; Slegers, Geijsel & van den Berg, 2002) led to the development of the second line of research, which found that the success or failure of innovation implementation was mediated through a range of individual and contextual factors. From this line of research (see, for example, Adelman & Walking-Eagle, 1997; Darling-Hammond, 1999; Fullan, 1997a, 1997b, 1982; Hollins, 1996; Hopkins & Reynolds, 2001; Huberman & Miles, 1984; Little, 1997; Louis & Miles, 1990; Schmoker, 1997), we know, for example, that the receptivity of the people involved is central to successful implementation. The importance of practitioners in establishing a culture for change that incorporates the emotional and relational aspects of change and secures staff participation and the development of effective professional learning communities was also emphasised. Moreover, studies in this line of research highlighted the importance of strengthening school leaders' ability to support and direct innovation in a desirable way and to ensure the allocation of necessary time and resources, including skilled

change agents. In addition, the organizational communication need to maintain a focus on constructive, goal-oriented action and collegial discussions was stressed. The establishment of relationships with outsiders (e.g., establishing contact among schools, between schools and local educational authorities and between schools and external support agencies) was also emphasized.

Although model theoretical approaches and research strategies are considered to offer clear understandings of the process of implementing changes (cf. Fink & Stoll, 2005), the implementation of ‘pre-packed knowledge’ thought to bring about changes in social systems is more complex than is implied in such models (cf. Parker, 1980). When innovations are seen as pre-packed knowledge, to be implemented and managed separately from ongoing work practices, weight is placed on the rationality of change agents (cf. Towndrown, Silver & Albright, 2007). Moreover, the perspective that the transformational power of innovations can only be evaluated in hindsight, through an analysis of the innovations’ fit with ongoing practices, reflects a simplified view of the layers of causality in human action (cf. Engeström, 2006). Finally, the transfer of ideas and knowledge between settings is highly problematic because both problems and contexts differ (Tuomi-Gröhn, Engeström & Young, 2003). Thus, the attempt to bring about changes in schools through innovative programs or tools does not easily result in concrete changes to school practices (Cuban, 2001; Tondeur, Van Braak & Valcke., 2007). These problematic issues direct attention to the study of the ‘local practices’ within which change efforts are carried out in order to facilitate a better understanding of the complexity and heterogeneity of the contextual and individual factors involved (Miles, 1998).

2.1.3 Innovation as mutual adaptation and co-construction

The practice-oriented research that evolved from the late 1980s to the present rejected the technical, rational, linear conceptions of innovation reflected in the model-theoretical approaches. Although research in this line continued to draw on the *implementation perspective*, the view of adaptation changed, in the sense that it became more appropriately seen as a process of ‘co-construction’ between the stakeholders involved in the implementation of innovation (cf. Datnow, Hubbard, & Mehan, 2002). In the practice-oriented approach, the processes of co-construction became the focus of the research, through which practitioners purposefully worked to identify and solve problems of practice through the implementation of externally and/or internally developed innovations. Thus, innovations became seen as the

outcome of organically led and managed work processes associated with the adaptation of ‘scientific discoveries’ to ongoing practices, deeply influenced by local context, with some predictable regularity and a great many unforeseen contingencies (Miles, 1998). This perspective directed researchers’ attention to the study of the creative and constructive activities of individuals, through which ideas, methods and products were developed, explored and negotiated as solutions to what were regarded as problems of practice. Thus, throughout the 1990s and in the present time, accounts of practitioners’ collaborative work have been considered by researchers to be important in gaining access to knowledge about innovative processes in work practices (cf. Anderson, 2010). This approach may be explained by the strong influence of constructivism that penetrated social practice research in general and educational change research in particular during this period.

This phase’s development gave rise to a growing interest in the study of the ‘naturalistic practice’ (cf. Miles, 1998, p. 54) of innovations and change, in which researchers’ attention was directed towards identifying the complexity of conditions affecting the processes of implementation through a focus on the *doing* of innovations (Datnow et. al, 2002) from both macro- and micro-level perspectives (cf. Blasé, 1998; Blasé & Björk, 2010). Success relies, not only on adaptation, but also on the capacity to alter innovations in ways conducive to purposes. For instance, drawing together some of the key findings from practice-oriented research work, and based on recent reviews of empirical studies (e.g., Blasé & Björk, 2010; Harris, 2010; Tondeur, 2007), the importance of a sufficient level of school autonomy (in contrast to what is considered harmful central control) as a favourable condition for the success of innovations in school becomes clear. Moreover, research highlights the criticality of stimulating school politics and professional development by building strong learning communities. In this respect, cooperation across schools and districts and the development of cultures of collaboration and collective effort have also been found to be of vital importance. Moreover, this research phase emphasizes the principal’s political role in facilitating and promoting such conditions in school settings (by, for example, building trust, developing democratic decision-making structures, encouraging autonomy, encouraging innovation/risk-taking, managing internal conflicts, developing teachers’ capacity for critique, maintaining a balance between district-level initiatives and school-based initiatives, and, specifically, building a shared leadership capacity across all levels).

While practice-based research has shed light on the conditions favourable to

innovations in education and on how the interactions among such conditions can form the bedrock for innovation, research on the work processes of how innovations and newness are created is hard to find, leaving this area of study significantly under-explored.

2.1.4 Summing up

So far, this review has elucidated the dominant foci and approaches to innovation that have evolved in the domain of empirical school improvement research from the early 1970s to the present. The view of innovation is quite stable, in that innovation is seen as *pre-packed knowledge* intended to create educational change—and, in particular, as something developed and imposed on school organizations from the outside. However, perspectives on the ways in which such *pre-packed knowledge* (e.g., ideas, products and technologies) become embedded in school organizations vary. Innovation's embedding has been understood as an event of adoption, as a process of implementation and mutual adaptation and as a practice of mutual adaptation and co-construction. In sum, the research work as a whole has generated valuable knowledge on a range of personal attributes and organizational conditions related to classrooms, schools and the later justification of these elements as vehicles for the attainment of successful innovation.

Notwithstanding the variations among the numerous approaches involved in the research work, I will argue that the main focus and aim of the reviewed approaches has been to generate knowledge about individual and organizational qualities favourable to innovations in education and about how the interactions among these qualities can form the bedrock for successful innovation. During the evolution of the research work, various dimensions and conditions have been confirmed and extended, which, when drawn together, constitute a long list of factors found to be conducive to successful innovations (or vice versa). This list includes, as a main component, leadership, which is the focus of the next section of this chapter.

2.2 Leadership in empirical school improvement research

In research on educational change evolving from the 1970s to the present, there has been an increased emphasis on the significance of leadership in relation to innovations for improving and making changes to education (cf. Bush & Glover, 2003; Hopkins et al., 2014). According to Hallinger (2003), it was in the 1970s that school leaders (i.e., principals) shifted from being

responsible for maintaining stability to being responsible for managing change processes in their schools.

2.2.1 Leadership as action

From the 1970s to the early 1980s, leadership was seen as comprising the actions that designated leaders took to manage innovation and change. As such, leadership was regarded as the actions performed by those in designated leadership positions, most often school principals. To better understand the role that principals play in the success or failure of innovation adoption, a primary focus was placed on their behaviours (cf. Brigdes, 1982). Thus, research on school leadership during this period tended to be *individual-oriented*. Its main concern was to reveal the factors affecting the role of principalship and to generate theories for how principals should act to become influential agents of change. Inspired by behavioural (e.g., Blake & Mouton, 1971; Bowers & Seashore, 1966; Chin & Benne, 1976), contingency (e.g., Fiedler, 1967) and situational (e.g., Hersey & Blanchard, 1969) theories, among others, researchers within the field identified a range of approaches and models that offered different perspectives for studying principals' roles in innovations for school improvement (Bossert et al., 1982; Bridges, 1982). Their aim was to discover what successful leaders could or should do to *influence* the factors pivotal to promoting change—that is, the factors that shape classroom instructional organization and school climate⁷ (see, for example, Berman & McLaughlin, 1978; Rosenblum & Jastrzab, 1980; Sarason, 1971). By drawing together some of the findings from this era of research work on what principals can do to affect the likelihood of successful improvement programs, I found that research during this period argued for such activities as: controlling and scheduling staff meetings; appointing staff to specific committees; publically rewarding staff associated with improvement programs; selectively 'protecting' teachers from outsiders or regulations; monitoring assumptions; publically demonstrating certain attitudes towards programs; controlling the flow of information about programs both inside and outside the school; lobbying for program support and direct funds associated with innovative efforts; and promoting programs outside the school.

⁷ In the literature, the notion of 'climate' is referred to alternatively as 'school environment', 'learning environment', 'learning climate' and 'social climate'. In their work on change and innovation, Bossert et al. (1982) explain that a common theme is that feelings of involvement or commitment to change among school staff tend to increase the success of change. Other themes address the influence of participants' senses of security, openness to ideas and cooperation.

In the early 1980s, a number of gaps in the *individual-oriented approach* came to light. Although the research identified the principal's role as being central to promoting or inhibiting change, it did not examine this role in any depth or perspective (Fullan, 2001a). The research phase also attracted criticism for focusing on the school as 'a closed system', without considering that principals' actions are mediated by a number of non-school factors (cf. Bossert et al., 1982; Gronn & Ribbins, 1996) that are considered to add complexity. Moreover, the individual-oriented approach generated critiques related to its placement of significant weight on the rationality of principals as change agents. As a result of these criticisms, the so-called 'new leadership approach' (cf. Gronn, 1996), which proliferated during the 1980s and still holds a strong position in the research field, gradually succeeded the individual-oriented approach. Central to the new leadership approach were a call for attention to leadership as an organizational quality (cf. Ogawa & Bossert, 1995) and the suggestion that leadership flows through the network of roles that comprises school organizations.

2.2.2 Leadership as roles in action

The shift to this new leadership approach did not change the view of leadership as the performance of leaders in formal positions; that is, leadership still tended to be conflated with the leader. However, the new leadership approach—which I here choose to label as a *relational-oriented approach*, based on its implication of a shift in focus from the leader *per se* to the quality of the relationship between superiors and subordinates (cf. Gronn, 1996)—signalled a view of leadership as systemic rather than individual. In essence, leadership became seen as an organizational quality (Ogawa & Bossert, 1995). The substantial body of research that evolved from the 'new leadership approach' was heavily influenced by conceptual models about leadership roles, often based on studies of leadership outside the educational field (cf. Hoyle & Wallace, 2005). The research work influenced by these conceptual models focused on ascertaining the understandings that leaders (and stakeholders) have of their leadership in relation to leading innovations for school improvements, as well as on determining the factors that shape that understanding. Central conceptual models included instructional leadership (see, for example, Richardson, Short, & Prickett, 1993; Sergiovanni, 1992, 1995) and transformational leadership (see, for example, Firestone & Louis, 1999; Sergiovanni 1994, 1995, 1996), but also moral leadership (see, for example, Fullan, 1998; Murphy, 1988; Sergiovanni, 1996; Smylie & Hart, 1999) and facilitative leadership (see, for example, Barth 1986, 1988, 1990; Lambert, 1998). Despite differences in perspectives with regard to the

responsibilities of leaders, these conceptual models of leadership roles often relied on cognitive approaches (cf. Bolman & Deal, 1994; Schein, 1985; Senge, 1990). Their focus was on the significance of leaders' acts of sense-making, as well as on leaders' cognitive capacity to invoke symbols, artefacts and metaphors that reinforce the meanings of the events and circumstances of change in ways designed to empower stakeholders to contribute to the successful implementation of school innovation. Findings from this research work on leadership roles showed that leaders are expected to be successful 'innovative' leaders, to the extent that they provide instructional leadership focusing on the interactions and activities that take place in classrooms and that they lead stakeholders with a vision in mind. The capacity to promote shared visions, a strong decision-making ability, the ability to encourage collaboration among stakeholders, the management of resources and the capacity to offer moral leadership (e.g., by providing a model of integrity, character and strong values for stakeholders in learning communities) were also found to be crucial qualities of strong leaders.

Although the research work influenced by the conceptual models addressed leadership as an organizational quality, rather than as a quality merely of individual leaders (e.g., principals), the models of leadership roles used contributed to confining leadership even more to formal, successful, 'heroic' leaders and the generation of what Harris (2008, p. 172) called 'silver bullet' advice. In fact, criticisms of this approach have highlighted its extensive focus on principals, at the expense of the majority of actors in school organizations and school systems (see, for example, Gronn, 1996; Hallinger & Heck, 1996; Spillane, Halverson & Diamond, 2004). It has also been argued that too little attention was paid to leadership as a practice (something common to most 'new leadership' approaches), that the research implied a return to universalistic thinking at the expense of attention to context and that its published works overemphasized success stories of leadership enhancing school improvement (cf. Gronn, 1996). It has been noted that, during this period, leadership as a field of study suffered from a dearth of detailed ethnographic case studies on *the dynamics* of leadership, since the bulk of the research was confined to interviews focusing on what leaders thought about their roles (see, for example, Brymann, 1992; Gronn, 1996).

2.2.3 Leadership as practice

Since the early 2000s, distributed leadership has become the most influential approach in research on leadership within the field of school improvement (cf. Harris, 2009; Hopkins et al.,

2014). From this perspective, leadership is considered to be the outcome of *concertive* or *conjoint practice*, which emphasises leadership as an emergent property of a group or network (Gronn, 2002, p. 3). The term *distributed leadership* was derived from cognitive and social psychology and draws particularly on the distributed cognition and activity theory (cf. Gronn, 2002, 2003b; Spillane, Halverson, & Diamond, 2000; 2004). According to Spillane et. al (2004, p. 4), distributed leadership is considered a lens through which to examine and better understand the interrelationship between the social and physical environment and leadership actions ‘by identifying dimensions of leadership practice and articulating the relations among these dimensions’. Thus, research works relying on the distributed approach to leadership tend to be what I will label *practice-oriented*.

Despite its popularity in the research field, the concept of distributed leadership, as used in empirical educational research in general, reflects conceptual ambiguity. In a review covering the years from 1996 to 2002, Woods, Bennet, Harvey and Wise (2004) suggested that most versions penetrating educational research seem to agree that the distributed leadership approach considers leadership to be an outcome of the dynamics of interpersonal relationships, rather than of individual action: That is, leadership is emergent, implies an openness of boundaries and entails varieties of expertise being distributed across the many, not the few. Various versions of distributed leadership, which also clearly signal the perspective that leadership is accomplished by two or more individuals, have been associated with collaborative, democratic and team leadership (cf. Mulford, 2008). Moreover, the label ‘teacher leadership’ signals that leadership can be accomplished by individuals other than those in designated leadership positions (e.g., principals) (cf. Harris, 2003; Fitzgerald & Gunter, 2008; Timperley, 2005). Some researchers open up leadership to all who have relevant expertise. For example, MacBeath, Oduro & Waterhouse (2004, p. 13) asserted that distributed leadership creates an opportunity for all members of an organization to assume leadership; moreover, ‘It does not necessarily give any particular individual or categories of persons the privilege of providing more leadership than others.

Similarly, in empirical improvement research relying on the distributed approach, scholars also speak of two or more individuals leading together (e.g., Camburn, Rowan & Taylor, 2003; Harris, 2009; MacBeath et al., 2004; Spillane, 2005, 2006)—thus substituting one individual for a (small) group of individuals. Sometimes, researchers consider teams or groups, focusing on how leadership could or should be distributed among members by

identifying the patterns or forms of leadership practice (see, for example, Day et. al, 2007; Hallinger & Heck, 2009; Harris, 2009; Spillane, 2005, 2006), suggesting that responsibility for leadership functions in schools is typically distributed among those whom principals bring into their leadership committees to successfully lead innovations for improvement. Hence, the research clearly suggests that distributed leadership, in all its forms and functions, does not occur without the support of principals (Harris, 2009), thus indicating the continuing view that principals hold a strong position in innovative change.

All of the contributions of practice-oriented research relying on distributed approaches are important to the development of research on leadership, as it pertains to innovations for educational improvements. These contributions openly challenge the norm of the single leader's actions and roles. Thus, the research work based on distributed approaches has extended our understanding of leadership as an *interactional process* that is socially and culturally situated. However, research adhering to the distributed approach has also garnered criticism, as it tends to promote descriptive or prescriptive models for the distribution of leadership to improve schools and teaching and learning processes. For instance, the final report of the Organisation for Economic Co-operation and Development (OECD) initiative, *Improving School Leadership*, included a chapter on distributed leadership, which advised member governments to develop models to create and support leadership distribution (Pont, Nusche, Moorman, 2008). Other concerns that have been raised include the perspective that the research viewing leadership as a distributed practice seems to neglect the micropolitics and power at work within leadership practices, since these relate to improving schools (Flessa, 2009; Lumby, 2013). This may be a result of the research on distributed leadership typically relying on (self-report) surveys and interviews of school leaders (cf. Bolden, 2011; Harris, 2005) and on other methods removed from the concrete work processes within which leadership is nested. Given this situation, the research work can be subjected to criticism for focusing too much on how individual leaders construct their understandings of leadership practices and not enough on the actions and interactions that are considered crucial 'in efforts to understand the practice of leading' (Spillane & Diamond, 2007, p. 6).

In debating the future of distributed research in leadership, some research studies (see, for example, Harris, 2007, 2009; Hopkins et al., 2014) argue for the need for research connecting the multiple performances or enactments of leadership in organizational change and development with a more explicit emphasis on distributed leadership practices and their effects

on schools and student learning outcomes. As stated by Spillane and Diamond (2007, p. 165), this calls for methodological changes: valid and reliable instruments and larger-scale investigations that build upon the current descriptive foundation. However, following this approach could easily result in new suggestions for how leadership is or ought to be distributed in order to achieve the desired outcomes of schooling. Research may face the dangers of adhering to what is already known beforehand, of generating new ‘silver bullet’ advice (as described by Harris (2008, p. 172)) and of failing to be open to the study of interactions considered important to our understandings of leadership practice.

2.2.4 Summing up

In this section of the review, I have concentrated on elucidating the dominant foci and approaches to leadership that have evolved in the domain of empirical school improvement research from the early 1970s to the present. The review indicates that the interpretation of leadership has been quite stable, in that it has consistently being viewed as *something done by individuals* in relation to *influencing and directing* something or someone in order to successfully accomplish innovations for improvement (or vice versa).

However, over this same time period, the perspectives and understandings of how the actions of ‘influencing and directing’ are made possible have varied. In the early 1970s, one point on which different researchers appeared to agree was that the problem was reserved for leaders in designated roles (most often principals) with the right and capacity to pursue purposes for the successful adoption of innovations. Leadership was, thus, viewed as an individual quality. During the late 1970s, this point was challenged. An emphasis on the problem of influencing and directing in relation to the relationships and cultural conditions of schooling moved increasingly to the fore. The focus was on the significance of leadership roles, of leaders’ acts of sense-making and of their cognitive capacity and skills to invoke visions, symbols, artefacts and metaphors that reinforce the meaning of the events and circumstances of improvement in ways designed to empower stakeholders to contribute to the successful implementations of innovations in schools. This shift implied a view of leadership as an organizational quality, rather than merely as a quality of individual leaders. In the late 1980s, however, this predominant focus on leadership as actions or roles in actions performed by one leader (usually the principal) began to attract growing doubts. The acknowledgement that no single principal or other individual leader had the capacity to influence and direct on his or her

own gave way to the perspective of leadership as a practice involving leadership functions or roles to be distributed to and enacted by individuals belonging to teams of leaders.

In sum, the research work as a whole has generated valuable knowledge about the acting and doing of leader(s) and the ways in which their actions are or should be performed to influence the conditions pivotal to successful innovations for improvement (be these adoptions, implementations and mutual adaptations or co-constructions and mutual adaptations).

Notwithstanding the differences among the several approaches involved in the body of research work, I will argue that all of these approaches place leadership with individuals (usually, principals) or with jointly performing designated leaders. During the evolution of the field, advice for those leadership actions found to be conducive to successful innovation has been confirmed and extended; when drawn together, these suggestions yield insight into the ‘guidelines’ or ‘recipes’ for leadership success in managing innovations for improvement.

2.3 The problem of leadership in innovative work

This thesis’s review of the key foci and approaches applied to innovations and leadership in the field of school improvement research over the last 40 years was not intended to be exhaustive. Rather, it was meant to be merely representative, designed to ground the present study and argue for its contribution.

Based on the review, I argue that the view of innovation in empirical school improvement research has been quite stable from the early 1970s to the present, in that innovation has consistently been viewed as *pre-packed knowledge* intended to create educational change—and, in particular, as something developed and imposed on school organizations from the outside. Although the review indicates that the perspectives on how innovations become embedded in school organizations vary, I argue that the main focus of the research has been to generate knowledge about personal and organizational qualities favourable to innovations and to determine how the interactions among these qualities can form the bedrock for innovation. When drawn together, these qualities constitute a long list of conditions and strategies found to be conducive to successful innovations (and vice versa), and the review shows that the conditions and strategies thought to be conducive to innovation in the 1970s are still emphasised in the research work of today. These include, for example, self-study or review, the promotion of networking, increased communication, culture as a focus for change,

the use of temporary systems, the importance of external support, and the *significance of leadership*. Noticeably, throughout the research work, leadership has been emphasized as an essential condition for the success of innovations for improvement and has been viewed as a matter of *influencing and directing something or someone*.

Despite these agreed understandings within the literature, I argue that existing research work has followed a path that has led to a reductionist view of leadership. Leadership has been explored as the individual actions, roles in actions or functions performed by individuals, from the one (most often, the principal) to the many in leadership positions created by a fixed division of labour within schools. This implies that leadership is placed with individuals who emerge as leaders in different constellations to fill the various leadership roles and functions assumed pivotal for successful innovations. As such, leadership has been narrowed down to the acts of designated leader(s), with an *a priori* attribution of agency and authority to those afforded certain rights and responsibilities within schools as bounded places. Thus, leadership has historically been conflated with the doing and acting of the formal leader(s).

These narrow views of leadership as a matter of influencing and directing, considered the domain of either an *individual matter* or a *matter of individuals* operating conjointly based on certain rights and responsibilities within schools, reflect a theoretical problem, which I have constructed from my position as a researcher taking a cultural-historical activity stance towards the situation. The problem is that the emergent nature of leadership and the interactions considered vital for our understanding of leadership and improvement efforts are left unexplored in the vast majority of school improvement research. In an attempt to bear in mind the emergent character of leadership and to not be ‘interactionally blind’, in this thesis, I employ a CHAT approach to the study of leadership in innovative work. I position CHAT as a practice-based approach that makes it possible to explore the actions of innovative work as they unfold within the object-oriented interactions of interdependent activities and mediating artefacts. The advantage of using this perspective is that it facilitates a detailed study of the ways in which leadership is constituted when project teams develop and realize newness. Through this theoretical lens, I will be able to question established research approaches and ongoing dialogues in the research field in ways that may contribute to an enriched understanding of the problem addressed. In the next chapter, I will further discuss and justify my use of the CHAT approach.

3 Conceptual framework

The overall purpose of this thesis is to gain an enriched understanding of leadership in innovative work in the context of school developmental processes. To pursue this aim, the thesis examines how innovative work is brought into being in the context of school development processes involving ICT, as well as the constitution and functions of leadership in this kind of work. While researchers within the field of school improvement research often argue that leadership in efforts to enhance teaching and student learning is fundamentally about interactions (rather than merely about the actions of leaders) (see, for example, Fullan, 2001a; Gronn, 2003b, 2010; Harris, 2009; MacBeath et al., 2004; Spillane, 2006, 2013), interactions have achieved only modest attention in the abundance of research work within the field. Moreover, researchers continue to conflate leadership with the doing and acting of people in formal positions of authority, indicating that formally designated leaders are understood to hold strong positions in innovations. Thus, this thesis employs the conceptual framework based on the third generation of CHAT to help us capture and examine the interactions considered important in understanding leadership as it pertains to innovations.

CHAT has been used extensively in research on innovative work across many disciplines and settings. However, it has not yet been used in empirical educational research to study how leadership emerges or to explore its manners of operation (however, see Gronn, 2003b). In this chapter, I will discuss how CHAT is an appropriate and viable approach for examining, interpreting and understanding *innovative work* and *leadership* in the context of school development processes. I begin with a brief introduction to CHAT, discussing the ways in which CHAT is thought to provide an enriched understanding of the two phenomena under scrutiny. I then explain in more detail how CHAT is used in this study to address the research problems. First, I discuss how CHAT enables an exploration of how ‘newness’ is actualized and produced in situated work activities. Second, I examine how CHAT provides a conceptual tool for exploring the initiatives, agency and authority involved in the constitution of leadership in such activities. Finally, I draw together CHAT’s contributions to understanding and unpacking the complex relations involved in leadership enactment in innovative work and its usefulness in depicting the functions of leadership in this kind of work.

3.1 The problem of leadership in innovative work

Although research on leadership, as it pertains to innovations for improvement in schools, is multi-faceted in its approach, one of its main problems is that the abundant research on school improvement has failed to fully explore the interactions thought to be fundamental to understanding leadership in innovative work. I consider CHAT to be a promising theoretical approach to address this problem⁸. From the perspective of CHAT, it is possible to examine leadership as an emergent property in social work activities, through which practitioners interact purposefully towards goals and purposes.

The development of the third-generation CHAT approach *à la* Engeström (1987) is based on the theories and ideas offered by the Soviet cultural-historical school founded by Vygotsky and his students, Leontev and Luria—theories that, in Europe and the U.S., appear to be most commonly classified under the heading of sociocultural theory (Wertsch, 1981, 1991). The original foundation of the theory was laid by Vygotsky during the 1920s and early 1930s and continued by Leontev and Luria, who developed his idea further and began to use the term ‘activity’. A review of the theory’s historical development can be found in Leontev (1989). For a comprehensive discussion of the many others who have contributed to the development of Soviet activity theory, see Zinchenco (1985), Kozulin (1996) and Bakhurst (1991).

Sociocultural theory rests upon a nondualist ontology (Packer & Goicoechea, 2000), which assumes that there is no demarcation between the external world and the world of individual, internal phenomena. In this theory, the physical and conceptual tools are the mediating artefacts between individuals and the world around them, and the relationships among contexts, individuals and artefacts are the products of practical social activity. The epistemological stance of CHAT is that active individuals construct knowledge through social interactions using mediational means, emphasizing that the means used by individuals influence their activities. At the same time, individuals reconstruct these means and/or construct new ones, which, again, affect their actions and the activities in which they engage in new ways (Packer & Goicoechea, 2000).

⁸ As used in this thesis, the term ‘theoretical approach’ refers to the basic images that guide thinking and research when working within CHAT, and ‘perspective’ refers to the distinctive point of view (ontological or epistemological) from which these images depart. ‘Theory’ is the statement of how and why the specific components of an activity are related.

On the basis of CHAT, Engeström (1987, 1999a, 1999b) developed a conceptual framework for studying the collective work activities involving mediating artefacts, which reveals the close connection between the acting subject and its environment. Engeström's CHAT framework of collective activity is illustrated in Figure 2, below. The triangular activity system model that explicates the components of an activity and its inner relations assumes that work activities take shape and develop through object-oriented, tool-mediated actions performed by subjects (i.e., individuals or groups). Engeström (1999b, 2008a) explained that this process (i.e., through which work activities manifest themselves in the dialectic relationships of such goal-directed, tool-mediated actions and interactions) is motivated by the *object of activity*, in the form of situation-specific problem spaces to be worked on and transformed.

Figure 2: The systemic structure of activity (cf. Engeström, 2005)

Such situation-specific problem spaces are often imbued with internal *tensions* and *contradictions* caused by the cultural diversity and multi-voicedness they embody. In CHAT, such tensions are seen as the driving forces of development in activity systems, since they may energize the negotiation and re-orchestration of resources and viewpoints brought to bear on various objects. The particular nodes in the upper part of the triangular model (i.e., the triad of subject, object and mediating artefact) are conceptualized as the 'production' portion of work. However, work activities are not reducible by individuals to mediated, goal-directed actions and interactions. Actions cannot be abstracted from their contexts, which, in the model, are articulated in terms of rules, communities and the division of labour. This layer adds a socio-historical aspect to the mediations to situated actions, which need to become part of the picture in the analysis informed by CHAT (cf. Edwards, 2010; Engeström, 1999a, 2009). Hence, the actions and interaction comprising situated work activities are located within the affordances and constraints of the socio-cultural contexts in which they take place. These contexts lay the premise, as well as any possible restrictions, for the subject's goal-directed actions. This

conceptual framework contributes to making transparent the multi-layered mediational means involved in the work activities through which various social phenomena emerge and take shape. Thus, this study shows how the work of interacting team members, whose social interactions constitute the social phenomenon studied in this thesis, is mediated, not only by the interplay of the team members and their personal skills and resources, but also by the cultural resources outside the given situation of the teams' work.

In research on work exploring the '*distributed multi-activity fields or terrains*' (Engeström, 2008a, p. 208, italics in original) of temporary, interdisciplinary, inter-organizational projects and project groups working together for a common purpose, such as the work conducted by the project teams in this study, the model of a single activity system was found to be insufficient. CHAT provides conceptual tools for examining and understanding emerging collective work activities that take shape when two minimally interacting activity systems are involved (Engeström 1987, 1999a, 1999b).

One way of examining the work activities that take place at the intersection of multiple activity systems is to use the concept of a 'meeting ground' (Engeström & Toiviainen, 2011, p. 35). Meeting grounds do not represent activity systems in their own rights, with long-term histories, routines and infrastructures; rather, they are uniquely framed spaces populated by practitioners representing interacting activity systems and are built into the historic objects, divisions of labour, rules and tools of these systems. Still, work activities taking place within such meeting grounds are driven by *potentially shared objects and outcomes*, for which practitioners are held accountable and evaluated. Such activities embody the increased relational complexity resulting from the increased diversity of cultures and multi-voicedness involved (cf. Engeström. 2008a). Consequently, when exploring innovative work and leadership in the context of school development involving several activity systems, it is necessary to be open to the multitude of voices, interpretations and resources at play. Such openness of exploration is made possible by working within the conceptual framework of CHAT—and, particularly, by the idea of *potentially shared objects of activity and tool mediation* within and beyond systemic borders. However, whether and in what ways various elements of the system can prevail as mediating tools and resources in meeting grounds is an empirical question conditioned by the extent to which such elements are committed to and used by those participating in the meeting grounds.

The review indicates that leadership related to work in embedding innovations in schools has been narrowly addressed through a focus on the acts of a designated leader(s), with *a priori* attributions of such a leader's agency and authority over those allotted certain rights and responsibilities within schools as bounded places. My empirical research attempts to contribute to the need for studies challenging this traditional perspective by investigating leadership in this kind of work, with an emphasis on the distinction between leadership and leaders and the complexity of relations involved in leadership constitution. CHAT represents a holistic conceptual framework that enables the conduction of just such a study. However, the conceptual tools of CHAT are rather abstract with regard to empirical studies of leadership in innovative work. I have, therefore, used intermediate sensitizing concepts to aid in the empirical analysis. These intermediate concepts refer to data-sensitive tools rooted in empirical data or related studies (cf. Ludvigsen & Digernes, 2009). In this study, therefore, the notions of *perspectives*, *interaction trajectories*, *interests* and *positioning* and the distinction between *exploitation* and *exploration* are used as intermediate sensitizing tools.⁹ The next three sections explain in more detail how the CHAT framework is used in combination with these notions to illuminate the research problems addressed. First, in order to gain insight into what renders development work innovative (which was one of the problems that warranted further exploration), I seek to determine how newness becomes actualized and produced in social work activities. The next section, therefore, discusses how newness is studied, with the help of the conceptual tools offered by CHAT and the notions of perspective and interaction trajectories.

3.2 The problem of newness

Innovation is often linked to the term *newness* and is viewed as a series of processes of implementing and adapting 'pre-packed knowledge' to ongoing practices, which are well known by designers and those leading and managing the processes. In CHAT, the creation of newness is also linked to implementation, but not simply in terms of the uptake and adjustment of things known in advance of the processes. Instead, the processes initiated to bring about newness involve the creation of objects that do not yet exist. Engeström (1999a) referred to such processes as expansive learning: 'learning in which the learners are involved in constructing and implementing a radically new, wider and more complex object and concept

⁹ I am aware of the debates on whether employing such intermediate concepts to inform CHAT is appropriate and of view that differ on this score (see for example Gonzáles, 2006; Engström, 2008b; Hyysalo, 2002, 2005; Gonzáles, Nardi & Mark, 2009; Engsetröm & Sannino, 2011; Postholm, 2010).

for their activity’ (Engeström & Sannino, 2010, p. 2). Actors’ experiences of disturbances or tensions within a practice may lead to a questioning of the existing logic and order (Engeström & Sannino, 2010, p. 5), setting in motion collaborative efforts to overcome problems through expansive cycles of creation and implementation. This indicates that smaller cycles of innovative learning have the potential to combine into organisation-wide transformations (Engeström, 1999a). Thus, what I label as *innovative work* in this thesis refers to the actualization and production of newness that emerge within such miniature learning cycles of expansion, set in motion through collaborative sequences of actions to overcome problems of practice. Tracing the actualization of newness in terms of expansion is, therefore, crucial to unveiling the emergence of innovative work. In CHAT, expansion refers specifically to the broadening of the object that motivates and gives meaning to a collective activity (Engeström, 1999a). Thus, to enrich our knowledge of how innovative work is brought into being, it is necessary to pay close attention to the way in which the broadening of the object occurs. Because the notion of *object* is rather abstract in the context of empirical studies, in this thesis, I have used it at the empirical level to discern the situations of specific problem spaces that attract the attention of project teams, as well as the ways in which problem spaces are addressed. Through this definition of object, it becomes possible to unveil whether, how and why expansions of situation-specific objects, worked on by interacting team members, emerge.

In CHAT, object-oriented actions and interactions are understood to be mediated by tools. Subjects construct objects using language, artefacts and other representational means. However, as mentioned in the introduction of this chapter, tool-mediated actions exist only in relation to the context within which such actions take place. From the perspective of CHAT, the context cannot be reduced to something that simply ‘surrounds;’ instead, contexts are interwoven with actions through its major role as a mediating means in object construction (cf. Engeström, 1999b). Hence, in understanding the actualization and production of newness, it is necessary to pay attention to what mediates the actions and interactions brought to bear on objects under construction and the ways in which these objects unfold over time.

The notion of perspective is helpful in depicting the numerous mediational means that team members commit to and use when working on problem spaces. Researchers like Holland and Reeves (1996) have pointed out that perspective is a hedge against simplified views of context, leaving space to consider the variety of resources brought forth by actors involved in collective work activities—even those elusive and contradictory ones reflecting the conflicting,

unsettled relations and positions in play. Perspectives that become externalized in collective work activities may be partially rooted in the personal experiences of the interacting participants and in the cultural tools, rules and conventions of the activity systems linked to the objects under construction. However, the ways in which perspectives function as resources are conditioned by their modes and by the ways in which they are negotiated, manipulated, developed and used in the situated interactions of involved participants.

On a theoretical level, the notion of ‘interaction trajectories’ is important because it allows for the possibility of understanding *actualization* and *the production of newness* as expansions of situation-specific objects. Interaction trajectories refer to the ways in which actions and interactions occur over a period of time (Furberg, 2010). Thus, they help to reveal how a given phenomenon evolves over time, as well as the actions and interaction that contribute to its evolution. Interaction trajectories provide a means to explore the moments of interaction, in which perspectives with the potential to encourage the expansion of the evolving objects are put into play by the participants and, therefore, become recognized and are elaborated through different sequences of interaction, implying the expansion of objects.

In the next section, I will outline how CHAT is supported by the notions of interaction trajectories and of perspectives as sensitizing means. I will also present an analysis of the constitution and functions of leadership, which is the second central problem investigated in this thesis.

3.3 The problem of leadership

Leadership is closely linked to terms like ‘agency’ and ‘authority’, which are often seen as attributes of formally designated leaders. In CHAT, agency and authority are not simply ‘givens’ that reside in individual subjects and the positions they inhabit; rather, they are dimensions resulting from collective work activities (cf. Engeström, 2009; Stetstenko, 2005). Such recognition in no way negates the positional authority of designated leaders with legitimate rights and responsibilities to make decisions and give directions (cf. Gronn, 2003a). However, whether and how legitimate authority becomes consequential in work activities depends on recognition and support among actors (cf. Engeström, 2009). Thus, the constitution and distribution of leadership are not easily captured. In order to understand leadership, therefore, it is necessary, not only to identify how participants interact with one another, but also to take into consideration the situation-specific objects that motivate their interactions and

the tools they use. Applying the conceptual tools of CHAT to the analysis of leadership is useful because these tools allow us to unveil and explain the complexity of initiatives and tools involved in leadership constitution and distribution (which is often unacknowledged in research on the topic). Relating individual initiatives and social interactions to the object also facilitates an identification of agency-authority relations consequential to the object's constitution and how it becomes distributed in situated work activities. It has been necessary to pay attention to team members' initiatives and, simultaneously, to how directions are 'produced' through social interactions to develop a nuanced picture of how leadership is constituted.

In order to address how participants relate to each other and the objects they work on, it is essential to be sensitive to the participants' perspectives. In object-oriented interactions, perspectives become resources that function as bids for position. Thus, positioning is situated in and emerges through interaction. Although the formal division of labour in work activities creates different positions for work participants, there are spaces of authoring—moments that participants use for positioning, rather than for being positioned (Holland, Lachicotte, Skinner, & Cain, 1998). In the flow of interaction, participants position themselves in accordance with, or in reaction to, the perspectives of others, accounting for the things towards which they are positioned. What become authorial positions in the various sequences of interaction, as well as the ways in which these positions relate to the object, are managed by interaction, but regulated by social, cultural and historical relations. In CHAT, the generation of agency-authority relations is always in the making—a reality that, in this thesis, is considered to be crucial to awareness when the aim is to gain insight into the problem of leadership.

The notion of interaction trajectories makes visible the spatial-temporal aspects of the perspectives (i.e., the resources). On a theoretical level, thus, the concept of interaction trajectories is helpful for becoming sensitive to the spatiality and temporality of the perspectives involved in the constitution of agency-authority relations.

3.4 The problem of defining the unit of analysis

At first glance, the problem of defining the unit of analysis seems to have been solved by working within the CHAT framework: The unit of analysis is undoubtedly the activity system or connected systems brought into interactions by their potentially shared objects (Engeström, 1987, 2011). However, researchers need to clarify the congruence between the object under scrutiny and the unit of analysis. Engeström reminds us:

Activity theory is not a specific theory of a particular domain, offering ready-made technics and procedures. It is a general, cross-disciplinary approach, offering conceptual tools and methodological principles, which have to be concretised according to the specific nature of the object under scrutiny. (Engeström 1993, p. 97)

The object under scrutiny in this thesis is the work conducted in planned meetings¹⁰ by project teams responsible for running school development processes in Norwegian schools. Taking their work as a point of departure, this thesis aims to develop new insight into the complex relations involved in leadership in innovative work and to shed light on and discuss the functions of leadership in this kind of work. This aim signals that the thesis is not concerned with how activity systems change, which is the focus of CHAT (Engeström, 1999b); rather, it is concerned with purposefully working project teams, for which it seeks to gain an enriched understanding of leadership in innovative work in the context of school development processes. Thus, for this thesis, the discrete trajectories of project teams' object-oriented work, rather than the involved activity systems, constitute the unit of analysis. However, working within CHAT implies that the wider contexts of teams' work must be taken into consideration in the study of the phenomenon of interest. Thus, I connect the work taking place *in situ* back to the systems, which are linked to the potentially shared objects worked on by the teams. The idea of perspective helps, as it serves to make visible the ways in which the team members committed to and used the cultural means of the activities and communities for which the teams' work was undertaken.

Although the object under scrutiny and the unit of analysis have remained consistent throughout the thesis, the problems to be elucidated and discussed have evolved. In the following, I will explain and clarify how leadership enactment in innovative work is examined, which is the third central problem addressed in the thesis.

3.5 The contribution of CHAT to exploring leadership enactment in innovative work

Building on the above discussion, in this section, I discuss the contribution of CHAT, in combination with the intermediate concepts of interests, positioning, exploiting and exploration, to an understanding of leadership enactment in innovative work. In CHAT, actors working on a potentially shared object are considered to have radically different motives for doing the work (cf. Edwards, 2010; Nardi, 2005). As Nardi (2005) points out, it is likely that

¹⁰ Information about the meetings, the teams and the context within which their work was situated is given in Chapter 4, section 4.2 and in Appendices 1 and 2.

people working together for common purposes have different motives for participating in their collaborative work activities. In situated object construction and reconstruction, such differentiated motives may generate tensions and contesting positions (cf. Miettinen, 2005; Miettinen & Virkkunen, 2005). This point is important when studying leadership enactment in innovative work, as it provides a means to understand the motives in play, with a view towards the potential tensions occurring in the dynamics among motives linked to object construction at the interactional level. Moreover, the potential tensions that may be provoked by the various motives and the ways in which these tensions are managed in interactions are important for the understanding of leadership enactment.

The notion of interest is useful in illuminating the motives beyond the objects worked on by participants. In CHAT, interests arise in work activities and give direction to initiatives and actions (cf. Nardi, 2005). Thus, the interests that give shape and direction to actions can, when made visible in interaction, illuminate the motives in play and the extent to which they generate tensions. Further, the notion of positioning is important in bringing to light the positions from which participants speak and the distinct perspectives to which they give voice when dealing with tensions. In other words, the notion of positioning makes transparent the perspectives and resources on which participants draw and the ways in which these become related to each other in the management of tensions. In sum, on a theoretical level, these intermediate concepts, when used within the conceptual framework of CHAT, help to explore and uncover the complexity of relations involved in leadership enactment, as well as the ways in which these relations combine into authoritative relations consequential to the directions produced in the broadening of the objects worked on.

To enlighten the functions of leadership in innovative work, March's (1999) concepts of exploitation and exploration are helpful. In this thesis, exploitation refers to modes of actions and interactions that are regressive in nature, in that they build backwards from specific goal sets (often sets of superiors), established infrastructures and cultural resources. Exploration, on the other hand, refers to modes of actions and interaction through which existing cultural resources became questioned, mixed and aligned in ways that produce new and unanticipated directions and outcomes. In activity-theoretical terms, these modes could be described as search actions. On a theoretical level, this distinction among modes of actions helps to identify the relationships among them, as well as the dominant modes of actions in use at the interactional level. It also facilitates the possibility of addressing the extent to which such modes imply a

regression or expansion of the objects under construction—which, from the point of view of CHAT, is seen as a prerequisite for the process of developmental work becoming innovative. This insight, thus, provides a starting point for the discussion of the functions of leadership in innovative work, as it sheds light on the ways in which leadership becomes consequential to the development of objects under construction and the outcomes produced by placing focus on *trajectories* rather than *solutions* (cf. Engeström, 1999a).

The focus on trajectories, in combination with the CHAT approach employed in the analysis, has methodological implications: Most critically, my use of the intermediate concept of a *trajectory* allows me to analyse empirically grounded descriptions. I will discuss these methodological implications in more detail in the next chapter.

4 Methodology

This chapter attempts to clarify the methodology of this study. First, I give an account of the study's design. Second, I reflect upon the process of data collection and provide a description of the total data corpus. Then, I account for the interaction analysis and analytical work deployed. Finally, I reflect upon the study's trustworthiness and explore ethical issues.

4.1 Study design

To examine *how* innovative work is brought about in the context of school development processes through ICT, as well as to determine the constitution and functions of leadership in this kind of work, I employed a qualitative multiple case study design (Stake 2005). According to Stake (2005, p. 445), such a design is well suited for research projects that seek to advance the understanding of a phenomenon within its real-life setting. In this thesis, I will engage in a detailed study of *innovative work* and *leadership* in the real-life setting of school development processes, with the aim of developing new insights into the complex relations involved in leadership in this kind of work.

The two different school development projects in Norway—the Pinewood project and the Riverside project—presented in the introduction (Section 1.2) constitute the cases for this study. These two cases were purposefully selected (Maxwell, 2005) based on the participating schools' existing regional or national reputations of being innovative in applying new digital technologies to work practices and of participating in wider partnerships to advance innovative work in education. Thus, I suggest that these cases create an interesting and highly relevant empirical foundation for my particular research agenda.

Stake (1994, p. 237) speaks of three types of case studies: collective, intrinsic and instrumental. This study falls under instrumental category because the cases were selected based on the assumption that they would provide insight into the phenomenon I wanted to study. However, although the cases were considered interesting, it was not the cases themselves that were the primary interest; instead, these school development projects were chosen to enrich our understanding of leadership in innovative work in the context of school development processes. Moreover, although there are two cases in this study, the study's aim is not to produce a

comparative analysis. Rather, the purpose of using two cases was to develop a richer dataset than could have been generated with only one.

Given my primary interest, the planned meetings of the project teams responsible for operating the two projects became the focus of the study. The decision to use these meetings as the empirical site for the production and analysis of data was strategic (Maxwell 2005), based on the assumption that such meetings would yield *interactional data* that would enable the in-depth analysis needed to answer the research questions.

Following Maxwell (2005), I employed an interactive approach, in which empirical data and theory constantly informed each other. The point of departure was the work performed in the project team meetings, which I studied with the help of the conceptual tools of CHAT and the intermediate sensitizing concepts explained in the previous chapter. In other words, there existed an interplay between the empirical data and the theoretical underpinnings and methodological principles expressed by CHAT. The naturally occurring interactions within the project teams' meetings provided empirical data, which were collected in audio-recorded observations and field notes. These offered useful information regarding the teams' work on problems emanating from school development processes, given this study's specific interest in the emergence of innovation and leadership in this kind of work. As a result of studying how the project teams acted purposively to develop practices, this study's detailed, qualitative, interactive approach provided in-depth evidence of how newness and directions are actually produced in the complex interplay between interacting team members and their surroundings, thereby providing detailed information about the complex relations involved in the constitution of innovative work and leadership.

Although case studies and ethnography are often thought to be informed by different methodologies, my collection of the data for these two cases was inspired by ethnographic principles. An ethnographic approach seeks to study the activities under consideration in naturalistic settings, in which participation and observation are seen as essential elements of being a researcher and of coming close to the practice (cf. Bryman, 2004; Holland et. al, 1998). By following the planned meetings of the project leadership teams throughout the entirety of both projects and by collecting data on the naturally occurring interactions, it was possible to research leadership and innovative work as 'lived experiences', collected through interaction analysis (Jordan & Henderson, 1995), rather than as 'reported' experiences, collected through

interviews. The two next sections explain the process of data collection in the project teams' meetings, provide a description of the total data corpus and clarify the analytical work.

4.2 Data collection and description of the data corpus

In this study, I relied, first and foremost, on audio-recorded interactional data and field notes of the schools' project team meetings. In order to build a detailed account of the interactions of the purposefully working teams, the data collection was organised as an evolving process that followed the structure of the meetings. These audio-recorded interactional data and field notes constituted the *core data* of the study and served as the foundation for the analytical work. However, though I began by analysing audio-recorded interactional data of the project team meetings, I also drew upon other types of data, for which I will account below. These data served as *ethnographical background data*, and they facilitated a better understanding of the purposes of interactions and the situations in which various interactions occur. The strict focus on interactions and what happens in them was, thus, complemented by a broader understanding of the socio-cultural context in which interactions take place (Engeström, 1999a). The 'native point of view' is not privileged in this study; rather, the view presented is mostly one 'from the outside'. This is not to say that the native point of view is not important; however, this particular analysis simply does explore such a point of view, focusing instead on the researcher's interpretations of the actions and interactions. Thus, the label 'ethnography-inspired' suits the study better than that of 'ethnography'.

In the Pinewood project, I collected a body of 25.5 hours of interactional data from 11 project team meetings and, in the Riverside project, I collected 8 hours of data from 4 project team meetings, for total body of 33.5 hours from 15 meetings (cf. Tables 2 and 3). In the different meetings, the team members sat around a table, most often with their laptops and/or physical documents (e.g., the meeting agenda and plans) in front of them. In each meeting, I placed myself next to the team members and placed an MP3 player in the middle of the table to audio-record the discursive interactions. During the meetings, I also took field notes, focusing specifically on capturing and documenting the physical tools involved in the teams' work.

In order to make evident and illustrate how the phenomena of interest in the study emerged and took shape, I chose particular *interaction trajectories* of the project teams' work for close analysis. These trajectories are presented in the three articles comprising this study.

Methodologically, emphasising the teams' interaction trajectories made it possible to understand innovative work and leadership as moment-to-moment achievements of the interrelation of tool-mediated object construction and reconstruction over time. Second, being sensitive to team members' perspectives during their interaction trajectories made possible an understanding of innovative work and leadership as a matter of social interactions, through which a plurality of interactional dynamics was involved in the interactions' emergence.

The illustrations in Figure 3, below, show how the teams whose work took place in the meetings were used in the articles to elucidate the particular phenomena explored. More information about the teams and the empirical context in which their work was situated is addressed in Appendices 1 and 2.

Figure 3: Illustrations of the project teams whose work was used in the articles to elucidate the particular phenomena explored in the study.

After each meeting, I transcribed the audio recordings using the computer software NVivo, using a sufficient level of detail for the purpose of the study, in accordance with standardized conventions¹¹. The quality of the recordings, for the most part, was satisfactory; however, sometimes, I had to listen to particular sequences at a slower pace in order to determine the content of the discursive actions produced by the participants. The transcriptions on which the analysis was performed were produced in Norwegian; however, the excerpts presented in the articles were rendered into English by professional translators. In the transcriptions, each person and organization is given an (anonymous) name, and the persons are related to their designated roles in their organizations, making it possible to 'see' the position from which each person is speaking in the formal division of labour (see Appendix 2). What are put forward are the interactions (in terms of discursive actions and interaction-mediated actions of artefacts, both physical and conceptual), rather than the persons. It is to such interactions that the reader's attention is directed, and it is such interactions that are analysed, interpreted and made transparent for the readers. This form of presentation strengthens, in a way, the credibility of the analysis produced, which will be accounted for in Section 4.5.1.

The tables that follow on the two next pages provide an overview of the data collected in both cases, including the types and amounts of data, the period in which they were collected and the status. In Table 2, the data collected on the Riverside project are listed, and in Table 3, the data collected on the Pinewood project are listed.

¹¹ I have not addressed 'micro-details' in the transcripts; instead, for the purpose of this thesis, I have chosen to focus on sequences of interactions on a more 'macro' level. Thus, I concentrate on the content of what is discussed and what is produced through discursive interactions, rather than on how communicative elements contribute to meaning-making. In the transcripts, I have included clarifying information, context descriptions (e.g., the use of physical artefacts), simultaneous/overlapping talk, interruptions, pauses, soft voices (such as 'yes' or, more usually, 'uhm') and humorous comments followed by laughter.

Table 2: Description of the data corpus for the Riverside case (in sum, 8 hours core data)

Period collected	Type of data	Status of data
Autumn 2009	<i>Project team meeting</i> 2 meetings: audio (4 h) and field notes	Core data
	<i>Interview</i> Project leader: audio (1 h)	Ethnographic contextualizing data
	<i>Documents</i> Agendas and minutes from the project team meetings	Ethnographic contextualizing data
	<i>Parent information meeting, Riverside</i> A half-day lecture for students and teachers at Riverside about how to use the software	Ethnographic contextualizing data
Spring 2010	<i>Project team meeting</i> 2 meetings: audio (4 h) and field notes	Core data
	<i>Classroom observation, Riverside</i> Field notes (3h)	Ethnographic contextualizing data
	<i>Leadership team meeting, Riverside</i> 3 meetings: audio (4 h) and field notes	Ethnographic contextualizing data
	<i>Interviews</i> Project leader: audio (45 min) Riverside principal: audio (50 min) 3 students at Riverside: audio (30 min each)	Ethnographic contextualizing data
	<i>Documents</i> Agendas and minutes from the project team meetings	Ethnographic contextualizing data

Table 3: Description of the data corpus for the Pinewood case (in sum, 25,5 hours core data)

Period collected	Type of data	Status of data
Autumn 2007	<i>Project team meeting, municipality</i> 1 meeting: audio (2.5 h) and field notes	Core data
	<i>Documents</i> Application and project plan Organizational analysis Current-state analysis	Ethnographic contextualizing data
Spring 2008	<i>Project team meeting, municipality</i> 2 meetings: audio (4 h) and field notes	Core data
	<i>Project team meeting, Hill</i> 1 meeting: audio (2.5 h) and field notes	Core data
	<i>Project team meeting, Cove</i> 1 meeting: audio (1.5 h) and field notes	Core data
	<i>Class-room observation, Hill</i> Field notes (1 h)	Ethnographic contextualizing data
	<i>Class-room observation, Cove</i> Field notes (1 h)	Ethnographic contextualizing data
	<i>Documents</i> Meeting agendas and minutes	Ethnographic contextualizing data
Autumn 2008	<i>Project team meeting, municipality</i> 3 meetings: audio (8 h) and field notes	Core data
	<i>Teacher team meeting, Cove</i> 3 meetings: field notes	Ethnographic contextualizing data
	<i>Teacher team meeting, Hill</i> 2 meetings: field notes	Ethnographic contextualizing data
	<i>Documents</i> Meeting agendas and minutes	Ethnographic contextualizing data
Spring 2009	<i>Project team meeting, municipality</i> 3 meetings: audio (7 h) and field notes	Core data
	<i>Interviews</i> Project leader: audio (45 min) Cove Principal: audio (1 h) Deputy head: audio (1 h) 3 teachers: audio (30 min each) Hill Principal: audio (1 h) Deputy head: audio (30 min) 2 teachers: audio (30 min each)	Ethnographic contextualizing data
	<i>Documents</i> Meeting agendas and minutes Current-stage analysis Final project report	Ethnographic contextualizing data

4.3 The analytical work

The analytical work in this thesis was guided by the analytical principles of interaction analysis (IA) (Jordan & Henderson, 1995). One asset of the IA approach, as discussed by Jordan and Henderson (1995), is that it provides very practical guidelines for the production and analysis of empirical evidence. The authors also clarify the framing assumptions of their approach (Jordan & Henderson, 1995, pp. 40–41), which correspond to the theoretical approach employed in this research project and its design as an ‘ethnography-inspired’ multi-case study. A central assumption is that organizational features, such as leadership and innovative work, are fundamentally social in their origins and that they emerge in the interplay between talk and material artefacts. Thus, the empirical grounding of research must be the ‘naturally occurring, everyday interactions’ that occur as people make use of resources made available to them in activities. One aim of this analysis is to determine how participants make use of such resources. For this thesis, this means that the analysis must focus on the leadership teams’ discursive actions and interactions, as well as on the material and conceptual tools used, in order to identify how innovative work and leadership emerged and took shape within the project teams. Since the study is positioned within CHAT, I was concerned, not only with what the practitioners were saying (as content analysis), but also with what was being ‘produced’ through social interactions when the team was working on objects (cf. Jensen, 2014).

Central to IA is the concept that the preparation of data for analysis and the actual analytical work are two sides of the same coin. Jordan and Henderson (1995) recommend that researchers use video recordings in the collection of interaction data; however, the data for this thesis were only audio-recorded. Despite the inherent limitations of audio-recorded data (i.e., its inability to capture the nonverbal signals and information that can be seen in video clips) I found IA analysis to be the most relevant way of analysing the discursive interactions for the purposes of my study because IA enables an analysis of empirically grounded interaction trajectories. Though my analysis began with the decision of which meetings to attend and continued with the writing down of notes and transcriptions of audiotapes—and, thus, did not follow distinct stages—it is still possible to trace back and describe the analytical work in terms of a sequential process.¹²

¹² Empirical observations and preliminary analyses have guided my interest in searching for theories and uses for theories. CHAT, together with the sensitising concepts that emerged in the interplay of my readings of theory and

First, using NVivo, I worked inductively to create an overview of the different themes that occurred in the teams' interactions. These themes emerged as problem spaces, to which the team members directed their attention in situated interactions. For instance, one problem space that gained attention for long stretches of time, regardless of which project team meeting was underway, was that of teachers' and students' learning. Second, after locating all sequences related to the various problem spaces, I selected recurring problem spaces that occurred across the data corpus, in which the team members used numerous meetings to negotiate different aspects of the problem spaces. Third, I identified sequences in which tensions surfaced in the project teams' negotiations of these problem spaces (see Appendix 3). For instance, I identified tensions concerning the institutionalized norms that regulate the roles of student and teachers in schools (cf. Article I). By listen to audio recordings and reading field notes, I was able to illuminate sequences with rich information about how contradictory issues were worked on in the project teams. During this work, I gradually identified the problem spaces and sequences of empirical interactions sufficient as foundations to elucidate the research questions guiding the analysis in this study. The methodological sections in the articles explain, in detail, the strategies I used to choose the sequences; therefore, the issue is not discussed any further here. The chosen sequences were finally subjected to close-up analyses based on CHAT and the intermediate concepts found suitable for investigating the particular phenomena under scrutiny. These last steps of the analysis are also clarified in the articles in detail; thus, the descriptions are left out here.

In all three articles, I was inspired by what Derry et. al (2010) has called a *play-by-play analysis*. This strategy consists of analysing 'selected episodes (excerpts) that all focus on a particular theme or issue (problem space) over the course of days, weeks, or even months to show how the issue was transformed over time' (p. 22). However, my interest was not primarily in documenting how various topics or issues were changed; rather, I focused on the 'production' of work activities to reveal how social phenomena were constituted and brought into being through such interactive productions. In Article I, by analysing selected excerpts related to the evolution of negotiations concerning teachers' and students' learning, I reveal the trajectory through which developmental work becomes innovative. In Article II, by analysing selected excerpts related to the evolution of negotiations concerning staff training and project

my work with the empirical data, has impregnated my understanding of the empirical observations' in an iterative way.

progress, I reveal the constitution and distribution of leadership in the making. In Article III, by analysing selected excerpts related to the groups' work on particular problems of practices, I depict leadership enactment in innovative work.

An important analytical strategy of this study involved considering production as an interactional accomplishment. Through this lens, the study analysed how the participants used and responded to each other's actions, using such actions as resources in their interactions. This exploration is in line with what Jordan and Henderson (1995) see as crucial in the study of interactions in social work practices: an analysis of how participants use different artefacts, both physical and conceptual, that are made available to them *in situ*. In this thesis, the ways in which the project group members used various physical and conceptual artefacts in performing activities is an important analytical focus. For instance, in Article 2, I analyse how resources (i.e., perspectives) were used in the production in ways that rendered the work innovative.

Although I have referred to the analytical work as a sequential process, I will underscore that it was, in fact, iterative (Derry et al., 2010). When analysing the audio data, I constantly shifted back and forth among the selected sequences, the interpretations and the research question, continually (re)hearing audio and (re)reading transcripts. Through this process, the sensitizing concepts¹³ that guide the analysis were developed, and my conceptual framework grew and become more defined, taking certain directions in response to the empirical material and the repeated readings. Furthermore, through dialogues with my article co-writers, with other colleagues in research group meetings, at seminars with international researchers and at international conferences, I had the opportunity to strengthen my analytical work by making my interpretations more explicit—and, in particular, by refining the analysis and broadening my understanding of the phenomena under study. I will further explore these aspects of 'shifting back and forth' and 'expanded understanding' in the next section, in which I reflect on my role as a researcher.

4.4 Reflections on my role as a researcher

As the producer of the analysis undertaken in this thesis and as the author of this text, I believe it is important to introduce my professional background and reflect on my role as a researcher.

¹³ See Chapter 3 for a description of the sensitising concepts.

Most of my previous work experiences involve organizational learning processes. However, my role in these experiences was not that of a researcher; instead, I served as an active participant, often in a formal leadership position, with the practical aim of developing new and improved practices and tools. My previous work experiences occurred in both public and private organizations. I also served as a principal responsible for school development processes carried out in project teams—a role that bore certain similarities to the Pinewood and Riverside projects. This experience has perhaps made me a *well-informed expert* (Geertz 1983, p. 57) in the focal field of this research. However, for the last nine years, including the years spent working on this thesis, I have worked in educational leadership education, serving as a part of an interdisciplinary research team on workplace learning. This background has strengthened my view of the phenomena studied. Broadly put, I argue that my experiences in organizational development and leadership in schools, as well as my experience outside schools, should be regarded as a strength, as this background has helped me turn a sharp eye on the focal topic and engage in a meta-reflection on my own *presuppositions* (Bateson 2002, p. 23). For example, as I embarked on this project, I was already familiar with the terms and artefacts used. Moreover, I did not have to spend time getting to know the field and was able to quickly earn the trust of the participants. Nevertheless, in the following, I will reflect on my role as a researcher and the problems at stake related to this role.

I considered my role to be one of a peripheral participant, or ‘participant observer’ (Postholm 2010, p. 65). My main interest was to get *inside* the work of the project teams in order to gain an emic understanding of the phenomena studied, without taking an active part in their work efforts. I attended the meetings on the same level as the team members, in that I was seated at the table together with them. The team members did not appear to be affected by my presence in the meetings. However, there was always a risk of being drawn into the problems of the projects and of beginning to think and act alongside the participants about how they might solve problems, rather than simply observing what was going on. Although I had explained my role and received participation consent from all involved, I experienced, in some cases, that the team members approached me to ask for my opinions (for example, on whether certain ways of resolving problems would be appropriate). These experiences could be difficult to handle, since I was not sure of how much to become involved. In such situations, I usually tried to use the technique of mirroring: That is, I showed interest and clarified my understanding of the question, and then directed the questions back towards the team.

Another problem at stake could be related to the question of who in the study was imposing a construction of reality on whom, which is a well known problem in qualitative research in general (Denzin & Lincon, 2011). My aim as a researcher was not to reproduce reality; instead, I sought to offer an enriched understanding of the phenomena studied. This understanding was not an arbitrary one; rather, it was one informed by CHAT, reflecting an etic approach that conflated with the emic approach taken in this thesis. The *back and forth* alternation between the emic position (which was the primary one) and the etic one used when interpreting interactions could become quite demanding, particularly when I needed to sort out and be aware of my own presuppositions. It could be that there were aspects of the phenomena studied that were more familiar to me and that, therefore, did not emerge as important analytical points in the beginning of the analytical work. Jordan and Henderson (1995) stated that there is a tendency to identify those aspects that one is conditioned to see, or even that one wants to see and explore. One example of such a situation stems from my analysis of leadership. In this context, I was initially quite familiar with how *the leader* is a very familiar script of *leadership* in the field. However, after some time, I came to reflect on this issue from a more etic position. As a result of this reflection, I found this to be an interesting topic worth pursuing—leading to an avenue of study that resulted in the distinction between *the leader* and *leadership* (Article III). These aspects relate to the relationship between being an insider and being an outsider (Adler & Adler, 1987), as well as to finding a balance between me, as a researcher, and the field/field members that I studied and with which I interacted. Using analytical tools in the analysis and having theoretically informed discussions were important in my process of finding the balance between these positions, which represented a wide range of perspectives ‘from somewhere’ (cf. Holland & Revees, 1996) shaped by the location (both social and theoretical) and the ‘lens’ of me as an observer. In other words, it was through the interactions of these emic and etic positions that my role as a researcher was constituted and that the understandings of the phenomena I studied emerged and developed.

4.5 Trustworthiness of the research project

The purpose of trustworthiness in a qualitative inquiry is to support the argument that the inquiry’s findings are ‘worth paying attention to’ (Lincoln & Cuba 1985, p. 290). This is quite different from the conventional, experimental definition, which involves showing validity, soundness and significance. Although several writers on research methods (e.g., Silverman,

2005) have demonstrated how qualitative researchers can deal with these issues by addressing the concepts of validity and reliability, for the purpose of this thesis, Guba's (1981) four criteria—*credibility*, *transferability*, *dependability*, and *confirmability*—will be used to demonstrate why the research project's findings are 'worth paying attention to'.

4.5.1 Credibility

Credibility is a reflection of whether the research findings represent a 'credible' conceptual interpretation of the information drawn from the participants' original data (Lincon & Guba 1985, p. 296). To address credibility in conducting this research, I employed three strategies.

First, in designing the research procedure, I deliberately included two projects, involving the work of several project leader teams operating in different layers of the development projects, rather than just one project and one or two project teams. This strategy provided a richer, more multilayered and more credible dataset than could have been generated by one project and one or two project teams.

Second, I enlisted my supervisors as 'more competent others' in conducting my research. As an inexperienced researcher in the field, I found this strategy to be very beneficial in facilitating a professional research process and minimizing any undue influences of my limited experience on the study's data. During the whole process of the study, I met with my supervisors periodically to pose and discuss questions about the research questions, methodology, ethics and trustworthiness, as well as other research issues. Moreover, one of my supervisors was a co-author for Articles I and II. I argue that our critical discussions of the possible interpretations of the data, in which we engaged during the processes of the data analysis, contributed to the study's credibility.

Third, throughout the research study period, I chose to attend various seminars for Ph.D. students in which the type of data analysis and the theoretical framework employed in this study were presented and discussed. These seminars enabled me to make transparent the ways in which the conceptual tools of CHAT that guide the empirical analysis are used, as well as to explore and judge the analysis in collaboration with peer students and highly respected academics. Since my analysis relies on audio data and on transcripts of this data, it was easy for these people to examine the sequences I analysed and to judge my interpretations. Through this 'peer review', I was able to reduce the risk of individual bias (cf. Heritage & Atkinson, 1984)

and strengthen the credibility of the analysis. Moreover, paper versions of the articles and the data analyses undertaken were presented and discussed in some of the meetings of the research group to which I belong, in working seminars of the national research school I attended during the research period, and at international conferences. In all of these settings, various observations, suggestions and ‘devil’s advocate’ questions were valuable in extending the credibility of all of the empirical findings.

Last, but not least, I have chosen to submit the articles to highly ranked international journals. During these journals’ processes of peer review, the articles were critiqued by experts in the field and were carefully revised in line with their comments prior to publication. I consider these processes to have served as another assurance of credibility.

4.5.2 Transferability

Transferability concerns the degree to which the findings of a study can apply or transfer beyond the bounds of the research project (Lincoln & Guba, 1985). The findings of this study present one construction of leadership in innovative work in school development processes, thus adding to the many constructions previously produced by researchers in the field over the years. Hopefully, this research work challenges these existing constructions, extending our knowledge of the subject by conveying nuanced and expanded understandings. It is a construction that, because of its focus on interactions and processes, rather than on leadership as ‘extraordinary individuals doing and acting’ and innovative work as ‘phases through which pre-packed new knowledge is adapted to change work practices’, may be considered a different reconstruction of what leadership and innovative work are about. Different, however, does not mean arbitrary. To address transferability, I have ensured that the analysis was performed in a systematic way, thus allowing the reader to form his/her own judgments on my version and its transferability (cf. Lincoln & Cuba, 1985). Furthermore, I have tried to convey to the reader the boundaries of the study and to retain an openness of theoretical and methodological considerations that may allow the study to be expanded and discussed in people’s discursive practices (cf. Ottesen, 2006). In my view, it is in the synthesis of the methods used, the empirical descriptions (such as the ones given in this thesis) and the theory that transferability may be determined. My hope in undertaking this extensive research project is that the thesis will produce findings that constitute a meaningful contribution to people’s practices, both in

schools and in academics, that it will have ‘generative power’ and that it will offer sufficient ideas and heuristics to inspire others to engage in similar research (Wardekker, 2002)¹⁴.

4.5.3 Dependability and confirmability

Dependability is an assessment of the quality of the integrated process of data collection, the data analysis and the theory generation. In contrast, *confirmability* is a measure of how well the study’s findings are supported by the data collected (Lincoln & Guba, 1985). To address the issues of dependability and confirmability, I have relied on independent audits of my research methods by two professors in the field of education through the arrangements¹⁵ of a midterm evaluation and a final evaluation, which occurred prior to the final delivery of the thesis for approval. Both in the midterm and in the final evaluation, my auditors thoroughly examined my audit trail, which consisted of the original transcripts and the text of the thesis itself. Based on precedent in qualitative research, they assessed both the dependability and confirmability of the project, as well as the completeness and availability of the auditable documents. They also evaluated the degree and significance of researcher influence. In brief, the auditors assessed the study’s dependability, its confirmability, and the degree to which the researcher’s influence was handled in a ‘trustworthy’ manner.

4.6 Research ethics

This research project follows the guidelines for research ethics for social humanities (NESH, 2006). Prior to collecting and storing the audio data, I reported the project to the Norwegian Social Science Data Service (NSD). I submitted two separate applications to the NSD (one for each case), and both were approved. The principals in all schools approved their institutions’ participation. An important part of the pre-field work period in both cases was informing the participants about the research project. This was done in accordance with the guidelines for consent, which means that participants were informed that they were able to choose whether or not to participate in the research project. All participants were also informed about the purpose of the study and their roles. Furthermore, they were informed that their participation in the study was subject to their own free will and that they were free to withdraw from the study at

¹⁴ Wardekker explains that generative power depends upon, among other things, the balance between results and investment, the question of whether the same or at least recognizable constraints apply in other situations and the ways in which the results are made known to others (2000, p. 271)

¹⁵ See <http://www.uv.uio.no/forskning/doktorgrad-karriere/forskerutdanning/gjennomforing/midtveis--og-sluttevaluering.html> for more information.

any time. Finally, they were informed about their rights with regard to privacy. None declined to participate, and none chose to withdraw during the research period. During the transcription of the audio recordings, all names were replaced with pseudonyms, and, in one of the projects, the gender was also made anonymous. Additionally, the names and locations of the organisations, the municipalities and the counties have been excluded from all of the published material. All audio recordings have been stored in a locked cabinet and have not been heard by anyone other than the co-author on Articles I and II and me.

Throughout the research project, I was present for all project team meetings. One could argue that my presence as an outsider may have affected the participants' behaviour; however, I believe that an approach based on openness creates a basis for mutual trust between the participants and the researcher. For me, it was important to carefully consider the participants' privacy and to conduct the research according to the current norms and practices for academic honesty (NESH, 2006).

5 Summary of the articles

Article I

Vennebo, K. F. & Ottesen, E. (2014). The emergence of innovative work in school development. *Journal of Educational Change*. DOI:10.1007/s10833-014-9234-0.

In the first article, we aimed to explore the ‘black box’ of developmental work practices to reveal whether and how work becomes innovative. In this article, we define innovations as ‘small scale changes initiated by groups of practitioners and/or researchers who want to experiment with novel ideas’ (Sannino & Nocon, 2008, p. 325). We address innovative work as the actualization of newness and change that may emerge within miniature learning cycles, evolving through the interaction of cooperating actors working together towards a common purpose. The concern in the article is how practitioners generate new ideas and tools that may be consequential to educational practices. In the article, we situate newness in practice, examining in detail how work processes may become innovative and how work may result in the production of something qualitatively new.

Based on an analysis of interactions in project team meetings in the Riverside project, in which the team faced and worked on problem spaces emanating from school development processes, the analysis shows how the interplay of the team members’ divergent perspectives on problems, combined with structural and cultural constraints and the possibilities of existing work practices, formed the basis for the emergence of innovative work. The work’s innovative potential was released in the moment when a team member, based on her experience and knowledge from outside the current situation, brought forth a new idea for coming to grips with the problem facing the team. However, it was through long-term problem-solving that her idea came into close interplay with the viewpoints of the others and, through a twin process of internalization and externalization of partly tension-laden perspectives, that the potential became realised. The analysis suggests that the work became innovative through the adjustment, alignment and development of the perspectives brought to bear on the problem in the team’s discussion. It is shown that individual agency played an important role in their work because the team members’ viewpoints served as mediating resources in their interactions, ultimately resulting in an innovative production: a new ‘three-part model’ for students’ and teachers’

learning through ICT, implying a transformation of rules, norms and the division of labour between students and teachers.

The findings imply that innovative work is the strenuous and long-term transformation and consolidation of individual viewpoints, leading to a collective reframing of the object under construction. It can, therefore, be argued that it is necessary to explore developmental work over longer stretches of time to unveil its innovative potential. Although we consider the work of the team to be innovative in the sense that the team members created something that was qualitatively new, we suggest that the problems at hand were discussed as practical, situational issues, rather than general problems in education practice. However, for innovative work to result in radical school-level changes in teaching and learning practices, it is argued in the article that it is necessary to systematically address the underlying contradictions that constitute the origins of the problems and tensions experienced in activities.

Article II

Vennebo, K. F. & Ottesen, E. (2011). School leadership: constitution and distribution.

International Journal of Leadership in Education, 15(3), 255-270.

The point of departure for this article was that schools and school leaders do not operate in a void. Instead, school leadership is embedded in organizational activities, emerging through the agency of individuals and collectives as they work to transform or sustain institutional practices. Against this backdrop, the article examines in detail the roles of initiatives, agency and authority in the joint efforts of a leadership team to produce resolutions and directions in developmental work and discusses how leadership emanates and becomes consequential to the progress of the work.

Based on an analysis of interactions within a leadership meeting in one of the participating schools in the Pinewood project, in which the team considered ways of proceeding with staff learning in their development of digitalized assessment practices, the analysis reveals that the leader team members advanced different, sometimes conflicting perspectives on how to proceed in order to reach the team's goal. The interplay of competing perspectives generated 'spaces of authoring', which produced opportunities for positioning. In

this positioning, the team members drew on resources residing in their formal positions within the division of labour, the community and the rules of the activity; however, they also connected to the wider context of their work. The ways in which the resources and tools were used is crucial to producing directions. Clearly, this finding shows evidence of a plurality of authorial sources of influence, from which, in this case, leadership emanated. Although principals are endowed with certain rights based on their formal positions, we found that it is only when the parties of the interactions recognize such formal rights that principals are able to carry out actions that influence directions and solutions.

In the article, we claim that leadership is an emergent property, constituted in complex chains of actions and oriented by purposes drawn from the interplay of hierarchical and distributed dimensions of agency and authority. It is argued in the article that school principals cannot rely on their formal positions; instead, resolutions and directions are produced through interaction, even when the principal makes the final decision. CHAT enabled us to unveil the process through which such rights were performed and the extent to which they became influential in the directions and outcomes produced. Further research based on CHAT is needed to capture the complexity of leadership in schools and to shed light on the relations and contradictions between the local enactment of leadership in schools and the wider societal activity of schooling.

Article III

Vennebo, K. F (under review). Innovative work in school development: exploring leadership enactment. Submitted to *Educational Management, Administration and Leadership*.

Rooted in the findings of Articles I and II and reflecting the emergent interactional dynamics of leadership and innovative work, the third article investigated how leadership is enacted and shaped in the context of innovative work. The purpose of this article was to explore work processes to understand how leadership is enacted and operates to produce new directions. To pursue this purpose, it is argued in the article that it is necessary to focus on how leadership is enacted in social interactions in innovative work and to distinguish between leaders and leadership (for more information, please refer to the review). By analytically focusing on the

micro-processes of work, the study explores leadership as it is enacted and operates in the making of ‘newness’.

Based on an analysis of project team meetings in both the Pinewood and the Riverside projects, the analysis illuminates leadership enactment as it unfolds in the interactions of the project team members’ work. In the article, I show how the teams’ work is tightly connected to local instantiations of partially shared objects and illuminate the constructions that go into realizing them. The objects were multi-faceted and imbued with multiple interests—both those of the cooperating team members and those of their communities (e.g., the teachers, the schools’ leadership teams, the students, the central or local educational authorities and the external actors involved)—within and for which the teams’ work took place. In the interactions of the team members; thus, these interests were at stake, creating tensions and forming the bedrock for how leadership was enacted *in situ*. The findings suggest that an important endeavour of the teams’ work was related to accommodating and adjusting the tension-laden interests voiced in the members’ interactions. The analysis unveils that the directions of the work emerged through the multi-voiced processes of negotiations and exchanges enacted in the dynamics of the objects, the individual actions of the team members and the disparate cultural means they committed to and used in their interactions. However, the negotiations and exchanges that emerged were often unstructured, characterized by unpredictable shifts in negotiating between the *what* and *ways to solve* problems, without much effort dedicated to exploring the interests and underlying motives behind these issues. This leveraging was far from constituting a straightforward process conditioned by an authority. Rather, the analysis reflects that this work was serendipitous, with the locus of initiative and the agentive actions changing from moment to moment within sequences of interactions. This finding is important, as it implies that leadership is not under the control of any of the involved partners or any specific individual (as appears in many accounts); that is, the centre does not hold (cf. Engeström, 2008a). In the article, it is argued that leadership is enacted in grids of authoritative relations constituted, challenged and changed through interaction, where the modes of action put at stake and the ways in which they are managed in the interaction become crucial for how directions are produced. In this study, the directions produced are considered to be pragmatic and open-ended.

The findings in the article imply that project teams, whose work is situated in spaces of loosely coupled partners, may benefit from paying more attention to and utilizing the tension

that emerges from local innovative work. In the article, it is argued that this might be possible through the establishment of a clearer division of labour to ensure that the important function of *managing tension-laden interactions* will be better addressed in leadership enactment than it was in the cases of the two teams studied. In addition, leadership is suggested to require enactment capabilities, which involve embarking on more stable patterns of interaction by exploring actions found to be conducive to innovative work.

6 Discussion and concluding remarks

This chapter comprises three sections. The first discusses the contribution of the CHAT approach employed in this thesis to the work's overall purpose of providing an enriched understanding of leadership in innovative work in the context of school developmental processes. The second discusses the central challenges related to the functions of leadership in innovative work and their implications. The following challenges are addressed and discussed: dealing with complex problems *in* innovative work and facilitating conditions *for* innovative work. The last section presents concluding remarks.

6.1 The contributions of CHAT to the study of leadership in innovative work

Although research on leadership, as it pertains to innovations for improvement in schools, is multi-faceted in its approaches and its objects of inquiry, researchers today are increasingly using a distributed perspective to frame their studies. There is a dominant focus on leadership as a set of actions enacted by formally designated leaders *within* schools (i.e., leaders occupying distributed roles or functions). Leadership is chiefly viewed as a relational capacity, based on behaviours and positions of rights (cf. Gronn, 2003b), that is considered to have a significant effect on innovations, which are mainly viewed as *new knowledge* that must be properly realized within school organizations. Although researchers like Spillane (2006, 2014) have argued that improvement efforts and leadership are fundamentally about interactions and that a focus on interactions is of vital importance to our understanding of the subject, interactions are paid only modest attention in the abundance of research on school improvement. My work is aimed at addressing this lack of focus by a) conducting an interactional analysis of purposefully working project teams to examine how newness is actualized and realized and how leadership is constituted through collective work activities and b) exploring how leadership is enacted when leaders are engaged in innovative work. Given that improvement efforts and leadership are fundamentally about interactions, these interactions need to be explored. The CHAT approach applied in this thesis enabled me to explore interactions in depth.

With a foundation in CHAT, this thesis adheres to the concept of *mediated, object-oriented actions and interactions* as a core principle for understanding collective organizational

work activities. The thesis is also situated in an understanding of the challenges involved in implementing innovations for improvement in schools. Organizational work is based on a belief that work is co-produced through interactions among involved actors, with the help of various resources. The concept of resources as *performative mediational means* has lately influenced the various theoretical approaches applied to our understanding of organizational work activities.

Things often taken for granted, such as language, social norms, organisational routines, work conventions and tools of various kinds, are the means through which people interact with one another in the world. (Spillane, 2014, p. 67)

Spillane argues that efforts to understand practice and improvement efforts should focus on these interactions, rather than on individuals' knowledge and skills alone (2014, p. 65). From this perspective, improvement efforts are thought to emerge and take shape in *the interplay* between interacting people and a variety of mediational means.

This view is similar to the conclusions I have drawn in Article I. In this article, I found that the team members used different perspectives (i.e., resources) in their joint interactive meetings when engaged in problems emanating from school developmental processes. The bringing forth of such different perspectives might result in conflict and tensions, which, by calling for resolutions, may function as potential springboards for the creation of innovative work. However, as the analysis shows, it is the extent to which such tensions are recognized and the ways in which they are addressed with the help of available resources that determine whether work is rendered innovative or not. Numerous other actors are present in the situated work of the teams. Moreover, I found in my observations that the resources brought forth by the participants as they discussed problems were moulded by and connected to the wider context within which their work was nested. This is shown in Articles I and III, which show the ways in which the team members incorporated personal, institutional and historical issues into their discussions.

As such, the CHAT approach has contributed to enriching our understanding of how the actualization and production of newness emerge and take shape in the *interplay* among interacting people and the variety of mediational means. As seen in Article I, the CHAT approach enabled me to trace the interaction trajectory through which a project team created something that was qualitatively new. This approach enabled me to study, not only how newness was created in the interplay between team members and their personal skills and

recourses, but also how the production of newness that was developed within the team was influenced by and dependent on cultural resources from outside the given situation of the team's work. Hence, CHAT enabled me to explore how guidance from the many layers of actors, who were linked to situated activities, might have exerted agency over local activities going.

The thesis also shows how the team's work opened up *spaces of authoring* (cf. Holland & Reeves, 1996) when the team was engaged with problems related to innovative work (Article II). Such spaces emerged and took shape in the interactional dynamics of the agentive team members and the resources on which they drew, producing possibilities for positioning. I have called this *positioning work*, and I have found that it is from such positioning work that leadership emanates; moreover, I have found that a plurality of influential authorial resources is involved in its constitution. Thus, I argue that leadership is not an *a priori* attribute of principals or of any other formally designated leaders. Rather, leadership in innovative work is collectively negotiated and achieved. However, by virtue of holding formal leadership positions, leaders have certain rights: for instance, the power and responsibility to make decisions (Gronn, 2003b). The CHAT approach applied in this thesis enabled me to unveil the process through which such rights were performed. In so doing, it contributed to enriching our understanding of how the actions carried out by formally designated leaders become influential in directions and outcomes. This influence occurs only when formal rights are recorded and supported by the parties involved in an interaction.

Given this understanding, it is fruitful to use CHAT to examine leadership enacted in innovative work. Since the CHAT approach demonstrates that the constitution of leadership in innovative work is highly dependent on interactions, mediational means and purposes to be realized, it enables a detailed examination of the complexity of relations and resources involved in leadership enactment, as well as of the ways in which the directions and outcomes produced are mediated within the many layers of interwoven relations and tools rooted in history.

This thesis shows how directions of work emerge in multi-voiced processes of negotiations and exchanges enacted through the dynamics of the objects, the individual actions of the team members, and the disparate cultural means that these members commit to and use in their interactions. The CHAT approach enabled me to uncover and enrich our understanding of the multi-voiced processes at play. In the case of the team meetings, these processes were typically unstructured, characterized by unpredictable moves between problem

finding/definition and problem solving (Engeström, 1999a), such that problem solving was given precedence. It seemed that the locus of agency was not given *a priori* to specific properties involved in the processes, as occurred in the cases depicted in the vast body of school improvement research (in which relatively strong agency and authority were attributed to formally designated leaders). Instead, leadership consequential to the directions produced was enacted in grids of agency-authority relations, which were constituted, challenged and changed through interactions. Thus, in innovative work, the leadership was not under the control of any of the involved partners or of any specific individual; that is, the centre did not hold (cf. Engeström, 2008a).

By examining such multi-voiced processes of negotiation and exchange, it became possible to unveil the extent to which the team members gave voice to different interests when working with objects. Moreover, the ways in which these interests and their underlying motives were explored in practice (which, in CHAT, relate to the action of problem finding) were relatively absent. This finding might indicate that the project teams strived to establish a real collaboration. According to Nardi (2005), a real collaboration will only take place when the involved participants' interests and motives are exploited and responded to, implying an alignment and accommodation of the purposes and motives in play. Edwards (2010) pointed out that the alignment of people and purposes does not necessarily mean total agreement; instead, it could involve mutual comprehension, respect and recognition.

Thus, if we draw attention solely to the relationship between the involved actors and the perspectives and mediational means in use, without linking their actions and interactions to purposes, we may be in danger of eclipsing the powers of the different interests and motives related to the purposes of collective work activities. In this way, we can assume leaders have the capacity to bend school communities to their purposes and, thus, deprive others participating in collective work efforts of their powers of interests and motives (cf. Engeström, 2008). Instead, it is important to unveil the mutual engagement towards purposes related to the problems under discussion. Through its focus on objects as problems to be worked on, CHAT forms a foundation for placing potentially shared objects, animated by different purposes, at the centre of work activities. It is not only that all work activities are driven by potentially shared objects; instead, objects are also constructed and reconstructed through work activities. Thus, to understand leadership and the ways in which it is enacted in innovative work, the problems worked on, together with the interacting participants and the mediational means on which they

draw during interactions, must form a vital part of the picture. The CHAT approach to leadership developed and applied to this study is slightly different from the distributed perspective taken by Spillane (2006), as it perceives leadership as a product of interactions among leaders, followers and aspects of their situations (i.e., the means through which they interact). In a distributed frame, the problem worked on is excluded. The emphasis is on the routines and structures for facilitating leadership distribution and relational work among leaders, rather than on the practitioners who work with and within them (cf. Halverson, 2007)—which implies that such structures are given priority as a point of departure for understanding leadership. However, in CHAT, the focus is on the performativity of interacting individuals who try to make sense of objects within the affordances and constraints of the context where the work takes place.

Leadership is always directed towards something. This ‘something’ is the object as a problem to be resolved, which might hold as many interests and motives as there are actors linked to it. A central finding revealed in this study is that the object worked on is not only a vital part of the enacted leadership; instead, with its multiple inherent interests and motives, the object invites particular interpretations and modes of action, which may be either explorative or regressive in nature. In this case, the directions reflecting the outcomes of the work were produced through the dynamics of the objects, the individual actions of the team members and the disparate cultural means they committed to and used in their interactions (Article III). By analysing how leadership was enacted, I found that the directions produced fell into two main categories: *pragmatic* and *open-ended*. The pragmatic direction involved team members finding practical solutions to problems at hand, whereas the open-ended direction involved finding solutions to problems being postponed.

In line with research based on a distributed approach to leadership as it pertains to innovations for improvements in schools (see, for example, Day et al., 2007; Hallinger & Heck 2009; Harris, 2009; Spillane, 2005, 2006), my study pays attention to the functions of leadership. However, these researchers study the functions of leadership within schools as bounded *place*, as well as the ways in which functions considered significant to innovations are distributed and enacted by individuals belonging to teams of leaders. In contrast, my study, informed by CHAT, examines the functions of leadership based on how leadership is constituted and enacted within *spaces*, in which project teams are engaged in problems related to innovative work. This perspective is valuable on both a theoretical and a practical level. On a

theoretical level, it can inform and inspire the discourse on leadership as it pertains to innovations. On a practical level, it can help us to understand the functions of leadership from a new perspective.

Researchers have considered the functions of leadership in light of its various functional tasks and the roles and sources of leadership these tasks encompass (see, for example, Camburn et al., 2003; Hallinger & Heck, 2009) in order to identify the functions that must be performed in innovations for improvements to be successful. Such functions are related either to core activities in schools or to the broader school context. In contrast, my study highlights the interplay among participants involved in situated work activities in particular spaces, analysing the social interactions among them, the interactivity between them, the objects worked on and the resources made available for the interaction. My study contributes by seeing leadership and its functions as emergent properties of object-oriented actions and interactions, constituted within layers of agency well beyond what acting leaders do in specific situations.

6.2 Central challenges related to the functions of leadership and their implications

The aim of this thesis has been to develop new insight into the complex relations involved in leadership in innovative work, as well as to shed light on and discuss the functions of leadership in this kind of work. As explained in this thesis (see Section 1.1), the functions of leadership refer to how leadership is enacted and becomes consequential to directions produced in innovative work, where the directions reflect the outcomes of the work. Based on the findings across the three articles in Part II of the thesis, this section discusses the central challenges related to the functions of leadership.

6.2.1 Dealing with complex objects inherent to innovative work

One challenge of innovative work is the need to deal with complex objects. The objects worked on by the project teams in this study reflect the complexity of the problems and the challenges they faced in attempting to create innovative work in the context of school development involving ICT. Not all of the teams' challenges involved the same complexities and scopes; instead, different kinds of problems emerged. Thus, the empirical evidence shows that objects can be rich and multi-faceted. For example, the learning problem negotiated in Article I and its objects might be contradictorily manifested in the multitude of motives involved in the face–

to-face interactions of the team members, exemplified by the tools for management development negotiated in Article III.

In the teams examined in this study, the objects represented different qualities as ‘things’ in the world or as representations of ‘things’ bestowed with values and motives, which gave direction to the teams’ collective work activities. The objects were engaged in certain courses of action (framed by rules, norms, routines and divisions of labour), which were developed in specific spaces and times. However, the objects also elicited possibilities for breakaway actions that temporarily bracketed the practical or cognitive impediments they encompassed. In this study, it became evident that every object had a history and action-assigned qualities, as well as experienced use values among actors linked to the object via diverse relations. The objects emerged as products or processes consisting of structures, rules, and relations that, together, energized and constituted a flow of engagement, agency and interactivity (cf. Engeström, 2008a) among the team members. Moreover, the objects under construction were carriers of underlying motives, which could be representations of the past, the present or the future. This implied that most objects were complex because they expressed and manifested themselves through historical dynamics and trajectories, constructed by multi-layered, temporally and spatially distributed actors and by forces beyond the given situations of the teams’ work. Altogether, the objects represented a multiplicity of voices from a variety of cultural worlds, presenting a mix of the real, the future and the experience of the present.

The objects created an interactional, multi-voiced condition among the team members and between the team members and the tools they committed to and used in their joint effort of dealing with the objects. I used the concepts of ‘spaces of authoring’ and ‘varying perspectives’ (Holland & Reeves, 1996) to highlight the challenges exposed by the active, co-creative, relational and interactional tool-mediated capacities within the team members’ engagement with problems of practices. In this matter, I was influenced by Engeström’s (1987) expansive learning theory. In accordance with Edwards (2009), Engeström (2008a) considered the co-operation among different actors of problem solving processes to represent learning processes involved in the co-production of problems and solutions. He addressed such processes as miniature learning cycles of expansion, set in motion through collaborative sequences of actions to overcome problems of practice. Edwards (2009) documented that problem solving processes are premised on informed contextual analysis, as well as on interpretations of the

problems worked on and the teams' capacities to make these interpretations explicit through the internalization and externalization of perspectives.

All three articles in this thesis demonstrate the various ways in which particular problems related to innovative work were dealt with by the project teams; however, only Article I focuses specifically on the teams' engagement with problems. This article shows the challenging aspects of dealing with problems in these types of settings. First, it shows that problems occur when one or more participants pursue a perspective, question aspects of ongoing practices or initiate initiatives that break with established norms of acting. Furthermore, the article shows that the problems became more complex, in that they also work backward on the team members. Alternatively, in Edwards' (2010) words, joint interpretations will usually reveal more complex problems, thus either confirming the practitioners' interpretations or revealing unforeseen features. However, my study also demonstrates the teams' difficulty in analysing and interpreting problems and their inherent pervasive tensions. As shown in Articles I and III, the teams' capacity to explore the problems and transform tensions into analysable and manageable challenges was limited. However, some of the team members' attempts to probe open-ended questions become potential sources for new directions. At one point, the teams' negotiations stalled into what I have labelled an *open-ended direction* and a *pragmatic direction*, and the team leaders were left to determine themselves how to develop solutions for tackling the particular challenges in practice, as well as for settling their potentially shared purposes. As a consequence, their long-term problem-solving processes ended in unsettled incongruity and practical solutions, rather than in collaboratively developed processes to promote the creation of newness. However, it is important to note that these directions are not 'end games' of work activities, as they appear in many accounts; instead, they are temporarily stabilized, unforeseen directions produced through ongoing actions and interactions. They are actions within the horizon of possible actions, moulded through the complex relations of accord and discord among the motives and interests of actors related to focal problems (cf. Nardi, 2005). Seen together, these findings illustrate the ambiguity of the functions of leadership in innovative work. On one hand, they illustrate the absolute importance of engaging in informed contextual analysis, of interpreting the problems *in situ*, and of making these interpretations explicit. On the other hand, the findings demonstrate the structuring challenges that might result from the complexity of relations in the problems worked on, as well as their often-fuzzy implications for the production of new directions. The challenges of structuring engagements with problems will be discussed in the following section.

6.2.2 Facilitating conditions for innovative work

Several studies have demonstrated the challenges of facilitating and designing school developmental processes that facilitate, not only administrative and practical problem solving, but also conditions for structured pedagogical inquiry and for the interpretation of the problems that might emanate from such processes. As discussed in the review chapter, strategies and conditions for facilitating such processes are frequently addressed and assigned as functional tasks of leadership in school improvement research. A shared finding across the articles in this thesis relates to the ways in which the teams' work with problems proceeded and took shape. The findings show that the work processes were serendipitous, unstable and unstructured, suggesting the importance of structuring teams' engagements with problems related to innovative work. In the realm of new public management (NPM), the evidence-based analysis of ongoing practices has been described as an important aspect of leadership related to the improvement of teaching and learning practices in schools (see, for example, Earl & Timperley, 2009; Robinson, 2011). However, in relation to the innovations for improvement in schools in general, review and analysis were considered aspects of leadership long before NPM entered the educational arena (see, for example, Berman et. al, 1977; Dalin, 1973; Fullan, 1982; Miles, 1975). What might have changed, though, is the view of evidence-based analysis, which now considers which things should count as evidence and, thus, inform the analysis.

The analysis of teams' interactions while engaging with problems related to innovative work, however, does reflect the challenges involved in informed analysis. Moreover, the study shows that this issue was not discussed within the teams, at least with regard to what an informed analysis might mean for their work. Rather, the study shows how the teams' performativity can be described as an 'activity snare', based on the fact that the teams facing challenging problems moved quickly and remained 'stuck' in *doing* problem solving. Such actions of doing were preliminarily regressive, rather than explorative, in nature and were performed with the help of 'ready-made' resources. The most interesting point is not that it is possible to document different actions, but that, rather, by scrutinizing the team members' actions and interactions across time and space, one can see the complexity of the mediational means involved in their interactions.

As argued above, the team members' interaction trajectories were often set in motion by the actions of the team members in questioning aspects of ongoing practices or initiating new ideas that changed the routinized ways of acting. These actions were often mediated by stories

from practices, which were seldom questioned and often expanded into new knowledge resources. As discussed in the preceding section, the problems that these kinds of actions involved were challenging to recognize and even more difficult to describe in analysable ways, which could have paved the path for the regeneration of the new knowledge necessary for innovative solutions and new directions. Relatively quickly, the teams, as argued above, became engaged in solving problems practically by utilizing the well-known resources at hand. In other words, as already indicated, the teams found themselves developing open-ended or pragmatic practical solutions to complex challenges.

How can project teams' perspectives towards problem solving be explained? One overarching emphasis of this thesis is that the directions produced during the teams' work processes cannot be explained through the singular results of individual capacities and control, through social relations or through the features of the activities within which the teams' work took place. The work took place in spaces embedded in the multiple layers of interacting activity systems. Activity systems comprise historically developed institutional practices, norms and socio-material structures, which may have considerable impact on the ways in which teams work on the problems and directions produced (cf. Engeström, 2008a). From a historic perspective, teams' quick attention towards problem solving may represent acquiescence to institutionalized practices in schools. Arriving quickly at problem solutions has been—and still is—a feature of school development work related to teaching and learning in schools, and several researchers have shown how stories from practice constitute important knowledge resources in this kind of work (see, for example, Little, 1982, 1993; Ottesen, 2014). Furthermore, when seen as cultural artefacts (Cole, 1996), such stories embody opportunities to engage with embedded knowledge and social practices developed over generations. Consequently, developmental work activities, as educational activities in general, embed residues of generally explicit institutionalized practices, reflecting specific ways of organizing, for instance, organizational learning, professional learning activities and assessment activities.

In this sense, the teams' overarching emphasis on problem solving can be seen as a set of actions and interactions attuned to institutionalized practices or as an organizational script for doing developmental work in school. When particular actions addressed ideas that progressed beyond routine (e.g., in Article I, when Beth initiated a breakaway action in the Riverside team's negotiation of students' and teachers' learning in the project) or in settings where team members were confronted with differentiated interests (e.g., in Article III, which

related to the Pinewood team's negotiation of the point-of-view analysis), the team members' use of and commitment to well-known resources seemed to take precedence, while the exploration of ideas and interests seemed to be challenging and to recede into the background. Given the lack of a guiding protocol for the work, it is possible to assume that the teams were attuned towards coordination mechanisms and the use of familiar cultural resources, which were challenging to break away from. Above all, Articles II and III demonstrated the challenge of managing complex interactions in the sense of exploiting particular kinds of actions that promote organizational innovative learning and knowledge creation. For example, specific actions, such as engaging with perspectives and research evidence, could help teams conduct an informed analysis. Addressing differing perspectives and opinions might be challenging; however, these differences have the potential to further existing ideas and spur the creation of newness.

6.3 Concluding remarks

The main methodological contribution of this thesis relates to approaching leadership, as it pertains to innovations for improvement in teaching and learning practices, through an analysis of the interaction trajectories of purposefully working project teams responsible for running school development projects. The term *interaction trajectory*, as used in this thesis, denotes the relationships among the units of moment-to-moment interaction taking place within the temporal and spatial spaces of negotiating problems related to innovative work in school development processes. Theoretically, focusing on interaction trajectories is important because leadership and innovative work are considered to be emergent, interrelated constituents of school development work activities. Methodologically, this study's emphasis on interaction trajectories has implied an analytical focus on chronologically selected extracts from sequences of team interactions. First, this emphasis has made possible an understanding of innovative work and leadership as moment-to-moment achievements of the interrelation of tool-mediated object construction and reconstruction over time. Second, the sensitivity to team members' perspectives during their interaction trajectories has facilitated an understanding of innovative work and leadership as a matter of social interaction, such that a plurality of interactional dynamics is involved in the interactions' emergence.

Several times within this thesis, I have discussed the distinction between problem finding/definition and problem solving (Engeström, 1999a). Problem finding/definition refers

to the sequential actions of questioning and analysing in relation to the situations at hand in order to determine the causes or explanatory dynamics of the emergent tensions inherent in the problems and challenges of practices. These are often taken for granted and do not serve as a point of departure for problem solving. Innovative work does not imply a simple transfer of pre-packed knowledge from outside of schools to school practices (Cuban, 2001; Tuomi-Gröhn et. al, 2003; Tondeur et. al, 2007). However, at the same time, doing innovative work in a leadership team differs from engaging in scientific inquiry in a research team. In school settings, leadership teams have to deal with concerns other than making sense out of problems of inquiry. Seen from an analyst's perspective, this thesis demonstrates the need for sensitivity towards the kinds of actions applied to problems related to innovative work, as well as towards the resources committed to and used in interactions to realize common purposes (i.e., the way in which leadership is enacted in innovative work). By addressing this need, we will be able to enrich our understanding of the leadership functions in this kind of work.

Seen from a leadership perspective related to innovative work, the findings reported in the three articles of this thesis demonstrate that problem finding/definition actions cannot be seen as obstacles to problem-solving actions. On the contrary, these kinds of negotiated interactions must be seen as intertwined, representing a central portion of leadership enactment in innovative work. Instead of taking these kinds of actions for granted or aiming to reduce them, those in charge of running school development processes should exploit them as opportunities to negotiate and explicate structures for managing innovative work in the context of development processes in schools. Such an approach involves the structures and kinds of actions used, for example, in the formative inventions that facilitate expansive learning (Engeström, 2008a, 2011). On a practical level, CHAT concepts can be operationalized to inform and guide concrete developmental processes and to be helpful in understanding and orchestrating such processes (Engeström & Sannino, 2010; Postholm, 2014). However, given the complexity of such processes, which often involve interdisciplinary and inter-organizational cooperation, leadership concerned about organizing the spaces in which potential new ways of working can be experienced and experimented with in a structured way is, in this thesis, assumed to represent a 'warranty' for realizing common purposes and goals.

If we are able to use the school development processes emerging in different *places* and *spaces* as a point of departure for analysis and to take the participants' perspectives and interests as an analytical starting point, we will achieve a richer understanding of the

complexity of relations involved in leadership in innovative work, as well as of the functions of leadership in this kind of work. Moreover, we will be able to illuminate and further explore the challenges related to these functions and their implications for leadership.

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Appendices

Appendix 1: The project teams in their contextual environments

This appendix provides an illustration of the project team meetings in their contextual environments and briefly discusses the contexts within which the teams’ work were situated. The contexts from which the empirical data were collected are marked with a ☆.

Figure 1: Illustration of the project leadership team meetings in their contextual environment

Contextual information

Several educational reforms have been initiated in recent decades in Norway. In 2006, the reform called Knowledge Promotion was introduced in primary, lower secondary and upper secondary education and training to improve students’ knowledge and skills. Better-qualified school leaders, teachers and teacher educators, in addition to new curricula in all subjects, including basic skills in the use of digital tools for learning across subjects, were some of the objectives of the reform. Both projects took place in the context of this reform, and the projects were led by the teams presented in Appendix I.

The Riverside project

The three collaborating schools (i.e., Riverside, Hillsdale and Rockton) in the Riverside project represented three different counties and were, thus, subjected to different local educational authorities (LEA). The LEAs involved in the Riverside project focused specifically on the development and utilization of digital technologies in schools. The schools’ cooperating partner, the business company Brinnerton, which provided the software, initiated the project in cooperation with Riverside, and the project was partially funded by Brinnerton. The Brinnerton representative and the pedagogical administrators from the participating schools in the project team designed the project collectively with backing from the leadership teams at their respective schools.

The Pinewood project

The three schools (i.e., Brickhill, Cove and Hill) that collaborated in the Pinewood municipality project attended the program called ‘Knowledge Promotion – From Words into Deeds’. The program was a supplemental strategy to the reform launched by the Central Educational Authority (CEA). By participating in the program, LEAs were supposed to enhance their ability to carry out school development projects in collaboration with external partners to obtain better learning outcomes and learning conditions for students (Blossing, Hagen, & Söderström, 2010). The Pinewood municipality received funding from the CEA for its local municipality project, and the project was assisted by an external facilitator from a university. The participating school projects had to plan, carry out predefined organizational analysis and report results during and at the end of the project. The school leader teams from the participating schools initiated and designed the project in accordance with CEA requirements, with backing from their local schools and the Local Educational Authority (LEA).

Comment: Norway is divided into 20 counties and 428 geographical administrative/political areas, called municipalities, which represent the lowest administrative level in Norway. Counties are responsible for the operation of upper secondary schools, and municipalities are responsible for primary and lower secondary schools and kindergartens.

Appendix 2: The project teams

This appendix provides a description of the project teams whose interactions were chosen for close analysis to elucidate the particular phenomena explored in the articles that comprise the study. The tables below describe the project teams.

Table 1: The Pinewood team

Name	Position
Beth	Municipal project coordinator, project leader
Hilda	Principal, Hill lower secondary school
Ann	Principal, Cove primary school
Simon	Principal, Rock primary school
Helen	External facilitator from a university, who regularly supported the work and participated in the meetings

Comment: The principals had full-time principal positions and led the project at their respective schools

Table 2: The Riverside team

Name	Position
Rebecca	Pedagogical administrator, Riverside upper secondary school, project leader
Monica	Pedagogical administrator, Rockton upper secondary school
Anne	Pedagogical administrator, Hilsdale upper secondary school
Hanna	Academic audience manager, Brinnerton

Comment: Rebecca, Monica and Anne held the positions responsible for pedagogical development in their schools and also led the projects at their respective schools. They also had teaching duties.

Table 3: The Hill team (The Pinewood project)

Name	Position
Hilda	Principal, project leader
Nick	Deputy head
Harry	7th grade Team leader
Mona	8th grade Team leader, not present at the meeting
Dan	10th grade Team leader
Alex	ICT coordinator
Helen	External facilitator from a university, who regularly supported the work and participated in the meetings

Comment: Hilda and Nick had full-time leadership positions. Harry, Mona and Dan held the positions responsible for coordinating pedagogical development in their grade teams and also coordinated the project activities for their respective grades and between grades. They all had teaching duties.

Appendix 3: Recurring objects worked on by the project teams

This appendix provides an overview of recurrent situation-specific objects worked on by the project teams that energized tensions. The analytical work made evident the complexity of the objects, showing that, in addition to being linked to one another, these objects had many inherent problems. For analytical purposes, the objects I identified were organized into four major groups, as shown in Table 1.

Table 1: Four groups of recurring situation-specific objects worked on by the project teams

	Recurring situation-specific objects that energized tensions
1	Designing, facilitating, monitoring and evaluating learning for student and teachers
2	Students' and parents' involvement
3	Purchasing, designing, redesigning and using tools for learning and management
4	Budgeting, resource consumption and financial reporting

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**PART II:
ARTICLES I, II, and III**