

Managing Adaptive Learning from the Middle

by

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Abstract

The main purpose of this study is to contribute to the understanding of how school organizations adapt their core technology to demands imposed from their external environments. Built on open system theories, schools are seen as interdependent with their environments and school professionals are also part of those environments. School boundaries, although they are seemingly clearly defined, are thereby seen as permeable membranes that allow for osmosis of knowledge, information and resources across them. The chosen theoretical perspective views schools as interactive learning systems that may be capable of adjusting their practices to changes in the environments through learning from experience. The term adaptive learning is therefore used to coin this outward looking process. Although there has been an intensifying interest in the problem of educational change during the last decades, adaptive learning theory has received only modest attention in the school management literature. The thesis, thus, aims to provide a contribution to fill this gap.

At the same time, the thesis builds on the premise of school organizations as loosely coupled systems. A core feature of the loosely coupled school is for example infrequent coordination of instruction from the top of the school hierarchy, paired with inactivation of control systems. Moreover, the abstract and uncertain core technology of instruction is mainly left to the discretion of the individual teacher. Loosely coupled theory recommends enhanced leadership and adaptation activated at the micro level as combined response strategies in order to deal with external demands in such a system. Adaptive learning is thus claimed to be most effectively activated from the local level of the school hierarchy, where the knowledge and skills about this abstract core technology are greatest. Accordingly, the thesis builds on the briefly mentioned premises by investigating the local enterprise of schoolteachers and middle managers in their efforts to bridge school interests with external demand in ways that promote school improvement. Through the inclusion of middle management practices, the leadership dimension of local adaptation is thereby illuminated and conceptually ordered.

In order to accomplish this research ambition, I have drawn empirical cases from the field of vocational training in Norway. Policy reforms, especially during the 1990s, have altered the external environments for most vocational training schools in Norway. Changes in educational policy have, additionally, coincided with significant changes in the working life environments of vocational schools, most typically due to transitions towards the knowledge based economy. A key aspect of effective school performance is therefore rooted in the ability to identify shortcomings and

gaps between school practices and working life demands, and to adjust instructional practices and routines in collaboration with key stakeholders. Research at five sites was conducted from the late fall of 2004 to spring 2006. The data material consists of detailed interviews with middle managers, other school leaders, teacher groups, and this body of primary data is supplemented by secondary data drawn from various sources. The research strategy is case oriented and exploratory as well as integrative in nature. Exploratory inquiry is combined with an integrative theory focus, where analytical categories emerging from the data are matched with theoretical entities.

The findings show that vocational training institutions operate in fragmented external environments. Fragmentation means that school professionals depend on, and have to relate to, several different domains in their environments: Local working life, the state directorate, regional governance and stakeholders of the teacher profession. A stream of different demands, often incompatible, is imposed on schooling from the surrounding environments, and many of these demands exert direct technical influence on school conditions. Due to the distributed curriculum structure of vocational training, paired with internal loose couplings, each subunit operates as an open subsystem directed towards an identifiable domain in the environments on which they heavily depend. This has implications for the response mechanisms of the organization.

The identified adaptive learning process shows that schoolteachers and their middle managers institutionalize a multifaceted and local routine grounded on learning in collaboration with working life stakeholders. The process is problem based and driven by various forms of dissonance. Adaptation is composed of three forms of integrative learning, and these operations are promoted by knowledge brokering devices performed by middle managers. The findings thereby confirm that middle managers are uniquely positioned agents for promoting local adaptation. The middle management contribution to adaptive learning is multifaceted, and four identified categories are conceptually ordered under the umbrella concept of the knowledge broker. The findings have also identified a broader social environment conducive to improve the match between school practices and working life demands. This environment, defined as a distributed community of practice, has key implications for the adaptive learning process. Here, middle managers, schoolteachers and external stakeholders form common conceptions and norms, and devise strategies for coping with the schools' multiple challenges.

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Oslo, 29th February, 2008

Jan Merok Paulsen

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Chapter 1: Introduction

For more than three decades, in the field of educational administration there has been an intensifying interest in the problem of educational change (Hargreaves & Goodson, 2006, p. 4). Schools are traditionally seen as conservative organizations, under-led and under-managed (Dimmock & Walker, 2004, p. 42), and characterized by an abstract technology of teaching and learning that has been largely left to individual discretion (Brunsson, 2002, p.4). From the school management literature, a variety of leadership foci and strategic directions have been suggested, in order to promote organizational change and school improvements: Transformational leadership (Leithwood, 1994), strategic leadership (Leithwood, Jantzi et al., 2004), distributed leadership (Harris, 2004) professional community (Bryk, Camburn, & Louis, 1999), and learning organization (Hallinger & Heck, 2003; Senge, 1990), - just to mention a few.

One perspective that has received only modest attention in the school management literature is adaptive learning¹ (March, 1991; Shrivastava, 1983). This perspective sees all organizations, including schools, as adaptive learning systems that adjust their practices to changes in the environments through learning from experience (March, 1994a). Built on open system theories (Thompson, 1967), the rationale of adaptive learning is that schools have to interact with the communities of their environments, in order to maintain sufficient inflows of resources and to maintain legitimacy (DiPaolo & Tschannen-Moran, 2005). A key aspect of school performance is therefore rooted in the ability to identify shortcomings and gaps between school practices and external demands, initiate learning processes, and finally adjust instructional practices and routines, in order to improve the fit (March & Lounamaa, 1999). Open system theories also view school boundaries, although they are seemingly clearly defined, as permeable membranes that allow for osmosis of knowledge, information and resources across them (Busher, 2006; Sergiovanni, 1994).

¹ In one of the earliest review of organizational learning theories, Shrivastava (1983) explicitly used the concept *adaptive learning* to characterize the process, through which organizations adjust and readjust their goals, rules and practices, in order to adapt to changes in the environments. Moreover, with reference to the work of Cangelosi and Dill (1965), Cyert and March (1963) and March and Olsen (1975), the author argues that adaptive learning represents a *distinctive perspective* on organizational learning (Shrivastava, 1983, p. 10). Cyert and March (1963) also includes search for solutions in the environments as a key component of the adaptive learning process (Cyert & March, 1963, p. 180)

Moreover, adaptive learning in educational organizations is typically activated from the local level of the hierarchy, where the knowledge and skills about this abstract core technology are at the highest (March, 1994a). It is therefore the joint local enterprise of schoolteachers and middle managers that may bridge school interests with external demand in ways that promote school improvement (Orton & Weick, 1990).

Following this line of reasoning, one could expect that the way local professional milieus learn from their interacting environments would influence their performance. This thesis builds on this premise and studies adaptive learning in vocational training schools in Norway. Policy reforms, especially during the 1990s, have altered the external environments for most school organizations in Norway. Changes in educational policy have, additionally, coincided with significant changes in the working life environments of vocational schools, most typically due to transitions towards the knowledge based economy (Castells, 2000). A key aspect of school performance is therefore rooted in the ability to identify shortcomings and gaps between school practices and external demands, to initiate learning processes, and finally, to adjust instructional practices and routines, in order to improve the fit (March & Lounamaa, 1999). The research literature has brought numerous evidence that schools are confronted with multiple external demands from a range of stakeholders with partly conflicting views on the rationale of schooling (J. W. Meyer, Scott, & Deal, 1992). Adaptive learning therefore involves a balancing act of managing external demands that may be inconsistent or even incompatible in nature (Brunsson & Olsen, 1993).

The purpose of this thesis is to clarify how school organizations of the vocational training segment deal with external demands through adaptive learning. In addition, the thesis focuses on middle managers in school organizations, and asks how, in the given context, they contribute to local adaptation from their professional domains. To answer these questions, research at five sites was conducted from the late fall of 2004 to spring 2006. The data material consists of detailed interviews with middle managers, other school leaders, teacher groups, and this body of primary data is supplemented by secondary data drawn from various sources. The remainder of the introductory chapter is structured as follows: In subchapter 1.1, I present the background of the study, including core characteristics of the field subject to investigation. In subchapter 1.2, I present the chosen theoretical perspectives and the conceptual framework. Thereafter, in subchapter 1.3, the methodological principles that have guided the study are presented, and finally expected contributions and the structure of the thesis are outlined.

1.1 Rational and background of the study

1.1.1 Adapting schooling to external demands

Several scholars have argued that schools are surrounded by complex, turbulent and uncertain environments (Leithwood & Louis, 1998; J. W. Meyer et al., 1992). Especially, it has been claimed that schools are profoundly affected by educational reform initiatives directed towards altering the ways they are structured governed and led (Björk, 2001). Developing adaptive responses, most commonly conceived as a capacity for organizational learning (Marks & Louis, 1999), is therefore a recommended strategy of school improvement (Hallinger & Heck, 2003). Organizational learning theories see adaptation as the organization's endeavors to improve the match between its own actions and demands imposed from the external environments through learning from experience (Cyert & March, 1992). From this chosen perspective, organizational adaptation is seen as an experiential learning process that encompasses both outward and inward looking sequences: Organizational actors focus on demands imposed from the environments, at the same time as those demands are internally filtered through incremental adjustments of action repertoires based on new insights (March, 1994b).

Accordingly, the adaptive learning perspective sees all schools as potential learning systems (Leithwood, 2000). But this does not mean that organizational learning is equated with organizational rationality (Thompson, 1967) or organizational intelligence (March, 1999). Organizations exhibit several impediments to effective learning (March & Olsen, 1975). For example, the inferences drawn from experiential learning may be ambiguous, myopic and superstitious in nature (Levinthal & March, 1993). Learning may also fairly well be interrupted by cognitive barriers among individuals and groups (Fiol & Lyles, 1985) as well as by lack of political will to adjust practices (Lawrence, Mauws, Dyck, & Kleisen, 2005). The adaptive learning perspective is, thus, a theoretical lens that analyzes the target oriented interplay between organizational actors and their environments, activated in order to improve the organization's fit with its external stakeholders (Levitt & March, 1988).

The notion of adaptive learning reflects a broad sensitizing description that requires some degree of initial specification. *Firstly*, the motivational drivers are to reduce gaps and mismatches between school practices and demands from dominant external stakeholders. Adaptive learning is, as such, problem based and target oriented (Cyert & March, 1992). *Secondly*, scholars have argued that adaptive learning is most effectively activated from the local

level of the school organization (Orton & Weick, 1990), undertaken by people that possess the necessary skills and expertise (March, 1994b, p. 193). As argued, mismatches between organizational actions and environmental demands often refer to problems that are close in time and close in cognitive and social distance. Adaptive actions therefore aim at responding to local feedback and improving the match with local environments (March, 1994a). *Thirdly*, adaptation is shaped by incremental adjustments in action repertoires based on previously re-negotiated understandings. Professionals and their managers seek to “adapt to their environments through small steps, observing and analyzing the consequences of incremental movements and making marginal adjustments”(March & Lounamaa, 1999, p. 157). And *fourthly*, models of adaptive learning see the process as cyclical and iterative in nature, simply because organizational problems occur and re-occur. This is not at least the case in educational organizations, since new populations of students enter the school every year (Dibbon, 2000).

Although organizational learning is increasingly seen as a strategic instrument of educational change (Leithwood, 2000; Leithwood & Louis, 1998), the research literature of educational administration exposes several ‘blank spots’. The first issue refers to the mechanisms, through which the technical, i.e. instructional, sides of schooling are adapted to environmental contingencies. These possible mechanisms are generally underspecified in the current literature. Dominant conceptions and explanations also tend to be un-nuanced and taken for granted in some areas of the research literature. New institutional theorists have, for example, long communicated the pessimistic image that school managers nearly *always* protect and buffer their teachers from influence from the environments (J. W. Meyer & Rowan, 1992). The notion of conservative schoolteachers that always make preference to persistence and inertia in their school practices is also widespread (Cuban, 1988). The adaptive learning perspective challenges, or at least nuances, these views by pointing to possible spaces for maneuver in strategies at the local level that may strengthen schools as adaptive systems (Leithwood & Louis, 1998).

The second blank spot issue refers to the important level of analysis, which is seldom taken into account in studies of organizational learning in schools. For example, intermediate levels of learning between the individual teacher and the whole school are relatively absent in empirical studies. Micro level analysis is generally underestimated, despite wide recognition that teaching is an extremely local and domain specific technology (Mintzberg, 1993). The third blank spot refers to the possible contribution to adaptive learning from managers of lower levels of the school hierarchy. The adaptive learning perspective highlights local leadership influence, simply because we talk

about *local* adjustments in school practices (Orton & Weick, 1990; Shrivastava, 1983). Most research foci on leadership contributions on school improvement have investigated principal practices (Marks, Louis, & Printy, 2000), although their direct effects are mostly restricted to cultural homogeneity (Mulford & Silins, 2003). Their action repertoire is, as known, not on very close social distance to the technical classroom behavior (Leithwood & Jantzi, 1999). Turning to research on middle management in schools, we know something about what kind of tension school middle managers perceive in their jobs (Wise, 2001). But paradoxically, we know not so much about how they exert influence on their professional environments (Bennett, Newton, Wise, Woods, & Economou, 2003). This thesis seeks to address these three briefly mentioned issues through the exploration of how middle managers² facilitate and promote adaptive learning from the locus of their knowledge domains.

1.1.2 The field of investigation

The chosen empirical context of this study is Norwegian vocational training. The overall mission of vocational schools is to qualify students for apprenticeship training in the workplace through designed courses of two years duration³. Since the mid-1970s, vocational training has been an integrated part of the Norwegian upper secondary school system. The major growth of upper secondary education towards a matured sector took place in the 1970s and 1980s (Opheim, 2004). The enrollment capacity was radically increased, and in the beginning of the 1990s, the system was capable of absorbing about 80% of a leaving cohort from compulsory schooling (Bergesen, 2006). At the heart of this development of systemic integration and growth in capacity was the new upper secondary legislation of 1974⁴ followed by a stream of regulations and directives. This regulatory basis integrated most lines of upper secondary schooling into a coherent national framework of national curricula, tariff agreements and teacher credentials.

² Middle managers in secondary education are typically heads of their subject department, besides being professional teachers in minor positions. They are, thus, leaders, managers and professionals themselves in combination (Harris, Jamieson, & Russ, 1995)

³ These two-year courses are subsequently followed by two years training in the workplace, regulated by a formal apprenticeship contract. Since the vocational training curriculum as a whole is composed by discrete and dispersed activities in separate locations, I use the term *distributed curriculum* to coin the arrangement. The term is more explicitly discussed in chapters two, six and nine.

⁴ The regulatory framework was labeled the Upper Secondary Act of 1974, and it was implemented from August 1976

Moreover, powers and authorities to govern the schools were in 1976 transferred from the state department to the 19 regional counties (Iván, 1998).

At the organizational level, the mainstream design is the one of a so-called combined school, an assemblage of all subject domains and lines of schooling in the same organization (Nylehn & Presthus, 2001). Norwegian upper secondary schools are, thus, large complex organizations grounded on a diverse collection of subject knowledge domains and occupational fields. Considerable internal diversity and fragmentation must therefore be expected because the domains reflect different traditions of teacher recruitment, curricula and pedagogical orientation. They are normally structured into relative autonomous subunits, 'federal' subject departments (Busher & Harris, 1999), which constitute the technical core of the school organization. Compared with their primary counterparts, secondary schools are therefore argued to be less integrated and more loosely coupled systems (Gray, 2004), and the Norwegian design is assumed to represent an archetypical case of this phenomenon.

The upper secondary sector in Norway underwent radical changes from the mid 1990s, due to the systemic reform labeled 'Reform 1994'. In vocational training, two major reform components in particular radically changed the school's external environments. *Firstly*, the regulatory sides of the reform ensured all applicants statutory right to enter upper secondary schooling in their home environments⁵. When Norwegian pupils leave compulsory primary school after their tenth year, they are thus ensured enrollment into upper secondary schooling, most commonly in accordance with one of their top-three priorities (Iván, 1998). Stable observable effects have been a more diverse student population in the classes (Helland & Støren, 2004) alongside a more complex core technology of instruction (Midthassel, 2004; Opheim, 2004). The *second* major change in the environments of vocational training schools took place through the implementation of a radical new curriculum structure. Aiming to raise the practical relevance of the training programs, paired with increased working life involvement, a *distributed curriculum*⁶ of training was launched.

⁵ This change in intake regime did not radically increase the number of enrolled students, since the more than 80 % of each cohort was already admitted to upper second schooling (Bergesen, 2006). Rather, and in accordance with the reform intentions, the shift in the intake regime ensured opportunity to enter the system for residual groups that formerly systematically fell outside (Iván, 1998)

⁶ The analytical label *distributed curriculum* is the author's term. Most commonly, the label '2 + 2 model' is used to describe this arrangement (Grøgaard, 2006)

The curriculum structure implies that a four-year training program is split equally between in-school instruction and apprenticeship training in the workplaces. More importantly, there are no structural instruments that may guarantee students the right to complete the training program. Seen from the school's point of view, half of the training chain takes place outside its organizational territory. And the working life institutions control the intake of apprenticeship candidates, because they, so to speak, select those they prefer. Furthermore, assessment and certification also take place in the workplace domain. This arrangement implies per se a case of strong dependency on contingencies and conditions determined in the local environments of the school (Grøgaard, 2006). School professionals of vocational training are therefore assumed to develop adaptive strategies in order to deal with external constraints and contingencies. From this stance, adaptive learning is assumed to be a key function of effective school management and a crucial condition for quality and successful performance.

1.2 Theoretical foundation

1.2.1 Theoretical perspectives

The thesis integrates theoretical perspectives drawn from different sources of organization theory and educational administration. The rationale of an integrated framework is rooted in the fact that no a priori theory is available for the illumination of the phenomenon subject to investigation. Search, selection and matching of different sources have therefore been made during the development of the study. The theoretical framework is, furthermore, developed in dialogue with the emerging design, data collection and construction of analytic categories (Ragin, 1994a). The study draws on concepts and insights from three broad perspectives of organization studies, in order to construct a framework applicable to the phenomenon of interest.

The *first* perspective clusters round the notion of schools as loosely coupled systems (J. W. Meyer & Rowan, 1977; Rowan, 1982; Weick, 1976). The original idea of loose coupling was elaborated through observations of several educational organizations located in different school systems (J. W. Meyer & Scott, 1992). Schools were, thus, viewed as archetypical cases of the inherent analytical properties of the idea of loosely coupled systems (Mintzberg, 1979; Rowan & Miskel, 1999). In the internal logic of the school organization, the loosely coupled perspective describes weak connections between subunits and hierarchical levels, and abstract and unclear mean-end relationships of the production core (Weick, 2001). Loose

coupling theorists have also claimed that the administrative apparatus of the school is only weakly connected to the classroom technology, or even decoupled from classroom work (J. W. Meyer & Rowan, 1977).

Turning to the external context, in the terminology of Scott and Meyer (1991), an organization has both a technical and an institutional environment. The technical environments exert direct influence on the production core through output control and incentives (Thompson, 1967), which is a typical marketplace logic. In contrast, the institutional environments evaluate the organization on structure, ideologies, professional norms, beliefs and social categories (Brunsson, 2002). The baseline proposition of loose coupling theory assumes that schools typically are subject to stronger demands from the institutional environment and only coincidentally imposed upon by technical requirements (Scott & Meyer, 1991). In consequence, schoolteachers and their managers are rewarded for follower-ship to normative and ideological categories alongside fads and fashion (Hanson, 2001), whether these external signals inform effective schooling or not. The thesis is critical to the wide generalizations of these propositions, although their explanatory value in some domains is recognized. I argue to turn back to one central, but mostly overlooked aspect of the original loose coupling idea, namely that it reflects a dialectical phenomenon (Weick, 1976). A school may be both loosely and tightly coupled, even so to speak side by side in a rather tangled pattern (Rowan, 2002b). Schools might be tightly coupled to some domains of the environments and loosely coupled from others.

Following recommendations of scholars (Rowan, 2002b, p. 607), the notion of loose coupling is treated as a sensitizing concept that only provides a theoretical lens that assembles a series of properties drawn from studies of school organizations (H. D. Meyer, 2002). The observation of loose coupling is therefore “the starting point, not the end” (Orton & Weick, 1990, p. 214). The thesis follows the latter view, and the study suggests for example a more nuanced view on environmental relationships within the vocational training field. Due to the strong dependency on the working life, structured by the *distributed curriculum*, it is assumed that vocational training schools are imposed upon by technical demands from the workplace, at the same time as being open to dominant ideologies and normative claims. In other words, they are subject to *both* technical and normative and cultural influence from the school institution (Scott, 1995). A detailed specification of external environments and demands is therefore a crucial issue for theory development of effective school management and leadership.

The *second* stream of theorizing incorporates a practice-based view to the study of adaptive learning in schools. A practice-based perspective

highlights the importance of the integrative learning context, conceptualized by the community of practice construct (Lave & Wenger, 1991). Moreover the theory directs more attention to the learning routine, i.e. the practice, that comes out of the collaboration among professionals (Orlikowski, 1998). The inclusion of a practice based approach enables the researcher to analyze adaptive learning at the micro level of the school more precisely through two additional specifications. *Firstly*, the study assumes knowledge integration within groups and communities to be a major component of the local adaptation process (Crossan, Lane, & White, 1999). *Secondly*, the thesis argues for the community of practice (Wenger, 1998) to be applicable, in order to capture the social context in which adaptive learning is situated. A community of practice may for example be formed when school professionals and stakeholders from local working life engage in a shared enterprise (Busher, 2006; Busher & Barker, 2003). Over time, such a social context may provide options for shared action repertoires that enable adaptive learning through mutual adjustments (Duguid, 2005). Specifically, when members form a community that crosses organizational boundaries, and, when their practice repertoire guide the participants' work in disperse locations, the prefix *distributed* is added to the community of practice in question⁷ (J. S. Brown & Duguid, 2001b; Wenger et al., 2002).

The *third* theoretical source sees school middle managers as boundary spanners (Mintzberg, 1993). The concept of the boundary spanner directs attention to the unique position middle managers hold at the interface between organizational levels, as well as their multiple memberships in a variety of social contexts (Pappas, Flaherty, & Wooldridge, 2004). It is stated that the middle manager's unique position offers several opportunities for synthesizing information and knowledge across boundaries and support adaptation (Currie & Procter, 2001; Floyd & Wooldridge, 1997). In particular, situated learning theories highlight boundary spanning roles performed by brokers and translators (J. S. Brown & Duguid, 1998), and this function is assumed to be crucial in a distributed community, simply because

⁷ As underscored by Etienne Wenger and associates, all communities of practice are distributed to some degree, since they typically recruit members from different parts of the organization. However, the concept of a *distributed* community of practice is used to describe the distinct category, where the community members have to cross major organizational boundaries or geographical distances in order to meet and to engage in the collaboration. Community of practice theorists therefore distinguish between *local* and *distributed* communities (Wenger, McDermott, & Snyder, 2002, p. 116). One implication of the distinction is that learning in distributed communities are more dependent of support mechanisms and brokering from individuals (Schultze & Orlikowski, 2004)

actors work in different locations. This theoretical position constructs the baseline understanding of middle management roles in adaptive learning.

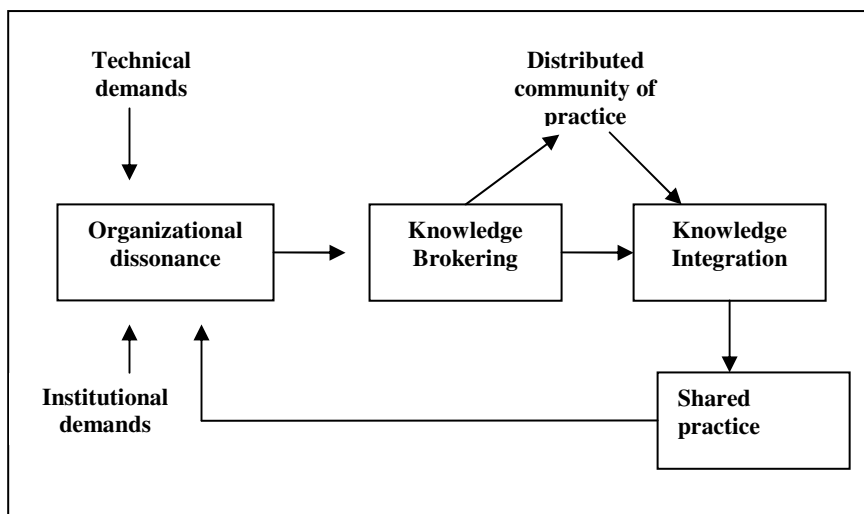
1.2.2 Constructing a conceptual framework

As previously stated, the thesis assumes that vocational schools have to deal with a blend of technical and institutional demands, imposed on schooling from different domains of the environments (Thompson, 1967). There may, for example, be expected inconsistencies between policy norms and demands from the workplaces when it comes to intake and socialization of recruits. Workplace managers versus politicians and spokespersons of the teaching profession may also have different ideas of how the school should be run. Whereas new institutional theory assumes that schools deal with inconsistent environments through decoupling (J. W. Meyer & Rowan, 1977) or ‘double talk’ (Brunsson, 1989), the thesis assumes that such buffering strategies will not fit within this working life domain. If workplace stakeholders’ expectations are ignored, the students will be exposed to failure in achievement of apprenticeship. The thesis therefore assumes that schoolteachers and their managers within the vocational training field have to deal proactively with such gaps and mismatches. Therefore, alternative propositions must be taken into account. Inconsistencies in external demands are conceptualized by the notion of organizational dissonance (Kvålshaugen & Amdam, 2000). The concept is used to capture gaps between existing technologies and current demands. Dissonance is furthermore assumed to activate goal oriented adaptive learning, and this proposition is a central component of the conceptual framework of the study. In practical terms, dissonance may activate search, absorption of information, negotiations with stakeholders and adjustment of instructional practice. The thesis therefore sees organizational dissonance as a potential activation trigger for adaptive learning.

It is furthermore assumed that school middle managers of this segment perform an important multi-faceted role as boundary spanners (Schwab, Ungson, & Brown, 1985), translators and brokers (J. S. Brown & Duguid, 1998) of conflicting views and interests. Moreover, this role is assumed to be critical in the adaptive learning mechanism in focus for investigation, simply because the actors involved in vocational training work in disperse locations. The assumption highlights the potential role middle managers perform in negotiations among schoolteachers and workplace stakeholders. Moreover, knowledge integration (Carlile, 2004), i.e. the integration of individual insights into a collective repertoire, is suggested to be the critical process in the adaptive learning cycle. The term describes a dual process: The first step

refers to the transformation of individually held knowledge into shared understandings (Bechky, 2003). The following step, although the two are intertwined, is about the conversion of revised understandings into an action repertoire, a shared practice that guides behavior (Wenger, 1998). The conceptual model of the study is outlined in figure 1.1.

Figure 1.1: The conceptual model of the study



The shared practice describes a locally negotiated set of frameworks and rules, a micro level routine that in this case may work as an adaptive instrument. It embodies, in this case, shared understandings and negotiated frameworks of organizing and processing vocational training, in order to create a best possible fit with working life demands. But, according to situated learning theories, institutionalizing a shared practice also requires the building of a community, a group of involved practitioners that own and apply the repertoire. The distributed community itself is therefore an integrated part of the practice and vice versa (Duguid, 2005). Through a balancing act, it is possible, at least it is assumed to be, to create an optimal fit to technical working life demands, on one hand, and to social obligations embedded in the broader school institution on the other. The conceptual model, as such, proposes a local and interactive process of adaptive learning situated in the context of investigation. Moreover, through the notion of knowledge brokering, the specific middle management contribution to the process is included.

1.2.3 Specifying the research questions

As previously stated, the overall ambition of the thesis is to advance the understanding of how schools adapt to external demands through organizational learning. Moreover, the thesis assumes that local adaptive learning is promoted by a genuine management and leadership contribution. The purpose of the study is, firstly, to capture the local adaptation phenomenon in a context of strong external dependency and inconsistent demands. Secondly and interrelated, the study aims to specify conceptually the various role middle managers perform in the processes, through which disperse knowledge is integrated, and action repertoires adjusted. The major research question therefore asks:

How is local adaptive learning managed within the given educational context?

From this major question, three research sub- questions arise:

1. What is the nature of the external demands imposed on school organizations?
2. What kind of learning and adaptation process occurs in order to deal with externally imposed demands?
3. What role do middle managers have for school organizations adaptation and learning processes?

As outlined, the conceptual model of the study hypothesizes that school professionals of vocational training are confronted with both technical and institutional demands from different domains of their environments, and that these streams apparently imply dissonance at the local level. To the second question, the conceptual model assumes knowledge integration hosted by a distributed community of practice to be the key component of adaptive learning. To the third question, adaptive learning is assumed to be promoted by a multifaceted boundary spanning and brokering repertoire of middle managers.

1.3 Methodology

The research strategy is case oriented (Andersen, 1997; Ragin & Becker, 1992; Yin, 1994) and exploratory as well as integrative in nature (Maaløe, 2002). The term explorative-integrative denotes that exploratory inquiry is

combined with an integrative theory focus, where analytical categories emerging from the data are matched with theoretical entities. The research process is therefore structured in a cyclical and iterative pattern, simply because the emerging analytical essence evolves through interplays between deductive and inductive research actions. In practical terms, empirical observations have regularly guided the researcher back to more search and review of theory and published evidence. Pre-conceptions have thereby been *compared* with analytical frames grounded on the case observations. The fashion of the research process mirrors a continuous *dialogue* between theoretical ideas and images emerging from the data analysis (Ragin, 1994a). The research process has been organized in three phases: 1) Literature review paired with analysis of secondary data, 2) an exploratory case study sampled by maximum variation and 3) an in-depth study of two sub-cases.

Based on the first review phase, an initial case study was designed for the empirical exploration of the central pre-assumed conditions and processes. The starting point was search among a relative large population of Norwegian upper secondary schools, assembled through search and review of policy documents. Thereafter, *five sites* were selected through the application of maximum variation sampling. This design component enabled the researcher to capture the most important contingencies and conditions that exerted influence on the major themes subject to investigation. Findings from the first case study were also systematically contested with large-scale macro level data, drawn from register databases⁸ and reported longitudinal research. In this part of the research process, longitudinal data was continuously contested with in-depth observations from the first case sample - in an iterative pattern. Major finding from this phase revealed substantial differences and demarcations between vocational training and academic schooling, even within the same school. And these differences referred to the core logic of schooling, environmental demands, institutional norms and leadership roles.

The initial case study also enabled the researcher to construct analytical categories through comparisons grounded on the substantive findings. For example, the emerging image of dissonance, as a stable feature within the vocational training field, emerged from this first exploratory stage. Moreover, preliminary categories of adaptive patterns were constructed.

⁸ Register data was drawn from Statistic Norway (SSB), see www.ssb.no, and from the central intake database, labeled VIGO, of Norwegian upper secondary education, see www.udir.no. These secondary sources displayed information about student performance, quality issues, completion rates and level of complexity in the technical organization.

Besides, the findings from this stage determined a major delimitation of the study, in terms of narrowing the empirical focus cases drawn from the vocational training field. The strict analytical inferences guided the further research towards an in-depth study of two vocational training sites drawn of the initial sample. In design terms, the shift from the first to the second stage of the case study narrowed down both the empirical scope and the conceptual focus. The methodological framework is elaborated upon in chapter 5.

1.4 Expected contributions

The study aims to advance the understanding local adaptation in educational organizations. Local leadership and adaptation is recommended as combined response strategies in loosely coupled schools (Weick, 1976; Orton & Weick, 1990). In this respect, the investigation is deliberately designed to capture analytical properties of adaptive learning, the integrative learning context and the situated middle management contribution. Through the in-depth focus on middle management practices, the leadership dimension of local adaptation is also illuminated and conceptually ordered. A suggestive typology of the knowledge broker role of middle managers may have significant relevance for educational organizations, and potentially, other professional bureaucracy contexts.

Through the design of the study, thesis is positioned to shed light over field-specific challenges of vocational training in Norway. The dissonance concept captures a series of quality problems that have been consistently reported and debated during the last few years. The findings and analytical categorization may therefore improve the understanding of inherent challenges in the distributed training curriculum in Norway. The application of the community of practice concept, guided by analytical categories and descriptive accounts, can also be applied as a framework for managerial school strategy⁹. The analytical framework of the study underscores the importance of shared understandings among school professionals and working life actors about quality criteria, behavioral standards, training methods and relevance of knowledge.

⁹ This is also the essence of Etienne Wenger and associates' recommendation in their latest book. See Wenger et al. (2002).

1.5 Structure of the thesis

The thesis is organized as follows: Chapter 2 aims at advancing the understanding of the logic of school organizations through a review of diverse areas of organization theory. Specifically, the notion of schools as loosely coupled systems is elaborated further, based on different theoretical perspectives. Moreover, possible response strategies are discussed in the light of theory. Chapter 3 presents the essence of the review of middle management research drawn from different areas of the literature. Findings from middle management in schools, across several educational systems, are matched with inferences drawn from research on non-educational middle management. Through the integration of these sources, a richer base of theoretical properties and empirical categories are provided. Chapter 4 presents a theoretical baseline framework for adaptive learning at the micro level of the school organization. The chapter, although drawing extensively on behavioral organization theory, introduces a complementary approach through the distributed community of practice construct. Chapters 2, 3 and 4 constitute the theoretical foundation of the thesis.

Chapter 5 presents the methodology framework of the study, including the guiding principles and choices made during the development of the design. Chapters 6 to 10 are the empirical basis of the thesis. Chapter 6 presents the Norwegian vocational training institution's external environments, based on secondary data drawn from a range of sources. Chapters 7 and 8 are descriptive narratives that form a contextual analysis of the two research sites conceived as sub-cases. Chapter 9 presents a conceptual analysis of the middle management role dimensions that underpins the notion of the knowledge broker. Chapter 10 presents the conceptual analysis of the adaptive learning process embedded in the distributed community of practice. Chapter 11 is a summary of the findings based on the analytical framework, the secondary data and the case studies. The chapter also includes a theoretical discussion of selected themes that may have interest beyond the educational camp. Also included in chapter eleven are reflections upon the contributions drawn from the study, in terms of implications for practitioners, policy makers and agendas for further research.

Chapter 2: Theoretical framework of the school organization

2.1 Introduction

The purpose of this chapter is to construct a theoretical baseline model of the school organization applicable for the research problem subject to investigation. Since no single theory provides a priori framework of the school's organizational logics, the review is based on search in various areas of organization science. The point of departure is the inherent ambition of the thesis to advance the understanding of how school actors adapt their actions in responses to external demands. Following this premise, it is crucial to pinpoint the precise nature of the school's environments. Moreover, it is also crucial to understand the internal constituents of the school organization, in order to capture possible response strategies and spaces for maneuver. Therefore, the chapter discusses both internal and external contingencies that influence the management of vocational training institutions.

How to understand the complex nature of school organization has been a central theme among scholars of organization theory since the mid 1970s¹⁰. The backdrop is the frequently reported image of an 'irrational' and complex organizational system. Schools were found to operate in complex, fragmented and diverse external environments (Thompson, 1967). At the same time, the research literature portrayed a fragmented internal structure, due to strong knowledge boundaries between the internal subunits (Clark, 1983). Moreover, both organization theorists and educationalists struggled to understand how schools could be so bureaucratic in form (Rowan, 1982), and yet be characterized by such weak control over actual teaching and learning in the classrooms (Ball, 1987; Cuban, 1984; Goodlad, 1984). Schools thus exhibit a managerial paradox, manifested by disconnection between the administrative apparatus and the technical core (Berg, 1995a; J. W. Meyer & Rowan, 1977). The above listed properties cluster round the notion of the loosely coupled school organization (J. W. Meyer & Scott, 1983; Weick, 1976). The concept has emerged as a cornerstone in loosely coupled system theory (Orton & Weick, 1990; Weick, 2001) as well as new institutional theories (DiMaggio & Powell, 1991; Rowan & Miskel, 1999). The review therefore utilizes both streams of theorizing about school organizations, in order to construct an applicable theoretical framework for understanding vocational training institutions.

¹⁰ See e.g. Weick, 1976; J. W. Meyer and Rowan, 1977; Mintzberg, 1979; Rowan, 1982; J. W. Meyer and Scott, 1983; Orton and Weick, 1990; Rowan and Miskel, 1999

2.2 The notion of loosely coupled organizations

Although scholars have applied the loose coupling concept to different analytical foci, the common ground is an image of schools as deviant from the mainstream conception of organizations as “rationalized, tidy, efficient and coordinated structures” (Weick, 1976, p.3). Loose couplings connote some lack of correspondence between goals, plans and intentions on one hand, and work processes and outcomes, on the other (March & Olsen, 1976). The term describes different forms of limitations in rationality, as “the concept of loose coupling indicates why people cannot predict much of what happens in organizations” (Weick, 2001, p.384). In a more general definition, Weick (2001) suggests loose coupling as evident,

when the components of a system affect each others (1) suddenly rather than continuously, (2) occasionally rather than constantly, (3) negligibly rather than significantly, (4) indirectly rather than directly, and (5) eventually rather than immediately (Weick, 2001, p.383)

The *first* criterion refers to connections between events that may appear suddenly, like in a threshold function. An illustrative example is demonstrated in the case when a subject department exceeds its budget, and inspection and audit procedures are activated from the school’s central office. Couplings are then tightened only when a critical demarcation point is exceeded. *Secondly*, loose couplings established occasionally are demonstrated in the cases of partial reinforcement and local rationality (Cyert & March, 1992). The *third* category refers to situations where A does not affect B, simply because their relationship is like a constant. This category explicates inconsistency between means and ends, for example, when any one of several means will produce the same ends such as in relationship to classroom work: “Despite all kinds of changes in curriculum, materials, groupings, and so forth the outcomes in an educational situation remains the same” (Weick, 1976, p.5). The *fourth* category refers to cases determined by indirect relationships. Indirect relationships are for example largely represented in the complex and fuzzy relationships between school leadership and student achievements: School principles exert influence on classroom work through affecting the teachers’ attitudes and understandings (Leithwood & Jantzi, 1999; Wiley, 2001). The *fifth* form is categorized by a lag in time between action and effect, which is archetypical in the technical core of schooling. A new curriculum may be implemented, and effects may be observable only after a long period, often of several years. In aggregate, the five categories of loose couplings say something about the degree of reliability with which ‘Y’ can be predicted, given the behavior of ‘X’ (Weick, 1976).

Scholars of loosely coupled system theory have argued that loose couplings must be understood as a dialectical phenomenon. As noted by Orton and Weick: “Organizations appear to be both rational determinate and closed systems that search for certainty and open systems searching for indeterminateness” (Orton & Weick, 1990, p.204). The recognition of the dialectical nature opens up for the possibility that these two incompatible logics may co-exist in different parts of the organization. Thompson (1967) captured this point theoretically through the distinction between three levels of analysis of the organization: The technical, managerial and institutional level. The technical core was described as a closed, tightly coupled, system that sought to eliminate uncertainty through buffering. The institutional level was seen as an open system, and the managerial level mediated those two subsystems, and thereby tightened the couplings between them¹¹.

Another crucial point exhibited by the dialectical perspective is the possibility that loose and tight couplings may exist side by side within the same part of the organization. This point is explicated by James G. March in his theoretical account of adaptive learning (March, 1991). Seen from a managerial point of view, couplings are loosened by exploration, experimentation, risk taking and variation in practices on one hand (March, 1994b). On the other, tight couplings are fostered by control, efficiency and exploitation of what already is known, e.g. in well-known methodologies (March, 1999; Weick, 1996; Weick & Westly, 1996). Accordingly, the same unit of a school organization can be simultaneously open and closed, e.g. *both* loosely and tightly coupled. Besides its dialectical and multifaceted nature, loose couplings also occur at multiple levels of analysis. As argued in more recent work, a loosely coupled school can be understood in terms of a “rich multi-dimensional coupling between many agents, which make up the system” (Goldspink, 2007, p. 40).

2.3 Observations of loose couplings in school organizations

The notion of the loosely coupled school emerged in organization studies from the mid 1970s (J. W. Meyer & Rowan, 1977). Loose couplings were consistently found in four areas of school behavior: (1) Inconsistency and

¹¹ Thompson’s (1967) proposition can be seen in Nonaka’s (1994) theory of the knowledge-creating firm. The organizational prototype is built on three organizational layers that are only loosely interconnected. The primary mission of managers is to therefore to fill the gaps between the layers, and to compensate for loose couplings through synthesizing the visions of the top layer, and integrating them into the operating repertoire (Hustad, 1999; Nonaka, 1994; Nonaka & Takeuchi, 1995)

unintended variation in work process and outcomes across school units¹², (2) managerial de-emphasis on instruction¹³, (3) inactivity of evaluation and control systems over classroom work and (4) lack of implementation of reform elements¹⁴ (Meyer et al., 1992). Although the loosely coupled perspective aims to capture properties found in most social systems, schools and universities were used as archetypical cases (Mintzberg, 1993; Orton & Weick, 1990).

2.3.1 Inconsistency and variation

The emerging new institutional theorists grounded their theoretical accounts on evidence of wide variance in practice and inconsistency (J. W. Meyer, 1992a; Rowan, 1982). Units at the same level were permitted to pursue unrelated or even contradictory didactical programs in practice. John W. Meyer and his colleagues found inconsistency and variation in instructional methods, work processes and learning outcomes across classes within the same school department. Furthermore, the same pattern was detected across departments within the same school and across similar schools within the same district. Eventually, unintended variation was found across districts within the same state, which is the policy formation level of the US public school system. As noted: “In our own research we found a great deal of variation from classroom to classroom in materials and methods, but this was largely independent of the organizational features of the schools and district (J. W. Meyer et al., 1992, p.60). Despite these features, a relatively high level of innovation in individual classrooms was observed. New materials and methods were routinely introduced to classroom work, as individual teachers tried out new didactical components in an experimental trial and error fashion. However, little of this activity is systematically organized at the school level or district level; rather diffusion was found to be random (Scott, 1992). The listed examples show that schools may operate different action programs simultaneously, even though they may be inconsistent. On the other hand, this form of variation may permit schools to be responsive to different pressures from the environments (Orton & Weick, 1990).

¹² Based on large-scale research on the US public school system, evidence revealed wide variance in practice and inconsistent learning outcomes across schools within the same district, and across departments and classes within the same school (J. W. Meyer & Rowan, 1977, 1992; J. W. Meyer & Scott, 1992).

¹³ This property is a major finding in research on working conditions of Swedish school leaders in the early 1990s (Berg, 1996; Nyttell, 1994, 1996)

¹⁴ Persistence in teacher practices, paired with ignorance of reform elements, has been recurrent themes in the work of Goodlad (1984), Cuban (1988) and Ball (1987)

2.3.2 Disconnected classroom work from the administrative structure

Besides variation and inconsistency, schools are also described as lacking internal coordination and integration of the content and methods applied in teaching and instruction in the classrooms (J. W. Meyer, 1992b). This pattern co-exists with lack of administrative control over classroom work: Lack of inspection, monitoring and evaluation. Schools, it seems, are to a large extent characterized by disconnection¹⁵ between the administrative corpus and the work processes in the classrooms (Brunsson, 1989). Similarly, the reviewed evidence indicates a tendency of managerial de-emphasis on instruction. It seems that school managers rather buffer their technical core, i.e. their teachers' work, from external evaluation and monitoring (Berg, 1995b; Mintzberg, 1993).

The reviewed literature exposes *three* forms of administrative disconnection. The *first* refers to ignorance of environmental demands, when for example the technical core of instruction is buffered from reform elements, by means of systematic de-implementation, ignorance or symbolically façade erection (J. W. Meyer & Rowan, 1991). The *second* form of disconnection addresses disconnection of control systems through inactivation. By this is meant that the administrative apparatus is inactive in relation to, and disconnected from, classroom work (J. W. Meyer & Scott, 1983). Disconnection in this form strikingly describes a huge paradox of school management. On one hand, a massive growth in administrative functions, staffing and the most sophisticated managerial systems in most school systems has been observed (Rowan, 1982). On the other hand, this administrative corpus is inactivated when it comes to the core activities of schooling.

As argued educational work seems to take place in the isolated settings of classrooms and landscapes, "removed from organizational evaluations, inspections or controls of a substantive kind" (J. W. Meyer et al., 1992, p. 60). In consequence, the work activities are disconnected from their effects. Another side of inactivation is manifested in that teachers are infrequently observed or evaluated; and the same is the case for school managers. As stated: "Although pupil achievement data are routinely collected for

¹⁵ The observed pattern of disconnecting control systems from classroom work has been wider conceptualized by the term of *decoupling* in the well-cited article of J.W. Meyer & Rowan (1977). The concept has some wider implication than the *disconnection* category as used in this present chapter. For example, decoupling also describes purposeful avoidance of integration of activities. The notion of decoupling has over the years been extended to various forms of organizational behavior, for example in theorizing about public sector reforms. See Brunsson (2002); Brunsson and Olsen (1993); Christensen and Lægheid (2002); Forsell (2001)

individual students and are used to monitor their progress and determine their opportunities, the same data is rarely aggregated so as to provide a basis for assessing the performance of individual teachers, schools or districts” (J. W. Meyer et al., 1992p.59).

The *third* form of disconnection is described by the *grammar of schooling* concept (Rowan & Miskel, 1999). Schools and their managers allocate several resources into formation of local school policies, pedagogical strategies for the future, developmental projects and a series of written declarations. This body of written documents constitutes a local ‘grammar of schooling’ (Hanson, 2001). As a rule of thumb, this ‘package’ of school strategies, plans, policies and visions for the future does not govern the technical work of teaching. Rather, it is a collection of local artifacts that conforms to longstanding norms and ideologies within the wider school institution: Norms, beliefs and myths that are socially and ideologically approved as ‘best practice’ in schooling (Rowan, 2002a; Scott, 1995). They constitute what is termed as ‘broad institutional scripts’ (Ogawa, Crowson, & Goldring, 1999) for what is judged as appropriate schooling in a modern society. And these scripts lend environmental legitimacy to those schools that conform to them by demonstrating follower-ship through their official ‘grammar of schooling’ (DiMaggio & Powell, 1991; Hanson, 2001).

The radical claim from the new institutional school is that the core activities of schooling, teaching, instruction and student learning, are *not* a part of this ‘grammar of schooling’. What happens in the classrooms is thus quite less coordinated and harmonized than the institutional norms, scripts, ideologies and approved recipes of how schools shall be organized (Hanson, 2001). The crucial point is that this ‘grammar of schooling’ is disconnected from the activities in the classroom. A similar phenomenon is described in Scandinavian new institutional theory (Sahlin-Andersson & Engwall, 2002). When for example new pedagogical ideas are launched during reforms, it is possible for school managers and teachers to decouple them from classroom practices through using *double standards* (Brunsson & Olsen, 1997). By inducing new pedagogical ideas and recipes into school documents, organizational structures, developmental projects, declarations and meeting agendas, the school uses the visible part of its organization to show potency (Forsell, 2001). School managers show the environments that it is in line with the contemporary agenda, ongoing reforms or the dominant ideology of the educational sector (Rowan, 2002a). Besides, by separating these artifacts from classroom work, the school avoid disturbance of any kind in the technical core (Brunsson, 2002). By this strategy, the school operates with double standards, one ideology for external use and one set of practices for internal use. The two incompatible standards are separated and isolated from each other, in order not to collide and cause conflicts (Brunsson & Olsen,

1993). Whereas the technical standard, the ‘tacit curriculum’ (Berg, 1995b) produces teaching and student learning, the official artifacts produce mainly words, i.e. written documents, presentations in seminars and meetings and written accounts for external consumptions (Forsell, 2001, p. 264). Disconnection through double standard, thus, represents a split between talk and action.

2.3.3 Invisible contracts and professional myths

Evidence from studies of Scandinavian school management in the 1990s¹⁶ adds some specificity to the disconnected classroom phenomenon. Based on large-scale evidence of work conditions among school managers, the researchers found consistent evidence of managerial de-emphasis on instruction. School managers systematically buffered their teachers from monitoring and evaluation of the work in the classroom. A tendency that school managers preferred to buffer their teachers from parent influence was also observed. The Swedish educationalist Gunnar Berg conceptualizes the professional relationship between principals and their teachers by the metaphor of the ‘invisible contract’ (Berg, 1991, 1993, 1996). The term denotes a social organization of teachers and the school principal, where the main ingredient is a systematic pattern of mutual non-interference. (1) On one hand, the school manager accepts that the classroom is the sole territory of the teaching corps, and that no administrative mechanism shall interfere in this domain. (2) On the other, the administrative sphere is the domain of the school manager, including labor division among administrators and coordinators. (3) The demarcation line of the invisible contract is the door into the classroom. The underlying norm claims that no school manager should break the contract.

The invisible contract phenomenon describes loose coupling from a cultural and normative stance. The evidence shows that the typical isolated classroom phenomenon found in Scandinavian schools is supported and protected by professional norms of individual teacher autonomy (Berg, 1995b). Beliefs and norms then constitute a protective belt, by which the classroom work is surrounded. The notion of the invisible contract, thus, specifies norms, professional myths and group interests in the maintenance of an isolated classroom technology (J. W. Meyer & Rowan, 1991).

¹⁶ The research project investigated working conditions for primary school managers in Sweden, and data was collected from the late 1980s to the early 1990s. The project was labeled ‘School Leaders’ Working Conditions in Sweden’ (Berg, 1991, 1993, 1995b, 1996; Nyte, 1996)

2.3.4 Disconnected classroom understood as agency problem

The administrative paradox of disconnected classrooms can also be understood as a classical agency problem. As noted by theorists, teaching is largely a private activity that is seldom or never coordinated from the administrative corpus of the organization (Mintzberg, 1993). More important, the distribution of information and knowledge about teaching is asymmetric: Neither the administrative hierarchy nor the environments know very much about what kind of knowledge is constructed in the classrooms, and how the construction is processed (Brunsson, 2002, p.4). School managers on the top of the hierarchy systematically lack knowledge about the work processes carried out by the agent, i.e. the teacher. Besides, the labor division between the principal and the agent is characterized by a systematic lack of specified contracts. The distribution is therefore extremely asymmetric. Moreover, the available pool of solutions available for recurrent practical problems is, largely, the agents' own knowledge asset. The knowledge base of the core technology is, thus, controlled by the professionals, and the managerial system will typically depend on this kind expert knowledge in their planning routines (Mintzberg, 1979).

The analytical point is that even if it is socially appropriate and legitimate to control the work process in the classroom, it would be an extremely difficult project. Controlling the teacher's work in the classroom is extremely difficult from the top of the hierarchy, and not least extremely costly (J. W. Meyer, 1992a). Effective control under such circumstances would require enormous human investments, because it is difficult to assess the precise effects of the streams of shifting situations that constitute classroom work. There is also a substantial causation problem involved in classroom work, especially when it comes to validation of cause and effects, due to the abstract and uncertain technology of teaching (Thompson, 1967). Validation becomes furthermore blurred by the substantial time lag between the actual work process and assessable student achievements. In common language, whether the quality of teaching is high or low, it takes some time before the effects are measurable in valid terms¹⁷.

Teachers are therefore favorably positioned to buffer their professional domain from uncertainty, interference and monitoring imposed from the

¹⁷ The validity problem when it comes to the measurement of effects of the teacher's work is significant, not at least because a reliable system would have to take into account that most causal factors are exogenous. A large group of causal factors is found on the outside of the school boundaries, in terms of the students' socio-economic status (Hallinger & Heck, 1996; Leithwood, Louis, Andersen, & Wahlstrom, 2004).

managerial sphere¹⁸. Asymmetric distribution of resources and power is therefore a stable feature of the internal structure of the school organization. As noted in theorizing about professional bureaucracies, of which universities, colleges and upper secondary schools are archetypical cases, the administrative pattern follows a rather asymmetric pattern (Mintzberg, 1993). The administrative structure seldom takes control over the operating core of the professionals, rather the opposite occurs. As stated: “Not only do the professionals control their own work, but they also tend to maintain collective control of the administrative apparatus of the organization” (Mintzberg, 1979, p. 334). The thesis therefore argues that the agency problem embedded in the disconnected classroom phenomenon should explicitly be taken into account, in order to construct the full picture of the loosely coupled school.

2.4 Explaining the loosely coupled phenomenon

The loose coupling phenomenon is, as such, both multi-faceted and spans multiple levels of the school organization. The reviewed literature also brings evidence that there are several partial explanations to this puzzling social pattern¹⁹. The theoretical sources cluster their social origins round three broad themes: (1) Uncertain core technology of classroom work; (2) Internal fragmentation and differentiation; and (3) Fragmented external environments. Table 2.1 provides a brief overview of the three main factors.

¹⁸ Mintzberg (1979) uses the term ‘oligarchy of the professionals’ to coin this stable feature of professional bureaucracies.

¹⁹ The review puts main emphasis on explanatory factors with particular relevance for understanding the loose coupling logic of school organizations. For example, theories of loose couplings on the individual and group level in decision making are therefore omitted, as elaborated in ambiguity theory by March & Olsen (1976) and in the classical ‘garbage can’ model by (M. Cohen, March, & Olsen, 1972).

Table 2.1: Origins to loose couplings in school organizations

ORIGIN	THEORETICAL PERSPECTIVE
Uncertain and abstract core technology	<ul style="list-style-type: none"> • Lack of clear causal connection between work process and outcome in schooling (Hallinger & Heck, 1996; Leithwood, Louis et al., 2004) • Important explanatory factors are exogenous (Witziers, Bosker, & Krüger, 2003) • Abstract core technology (Thompson, 1967) and privatized (Berg, 1991; Brunsson, 2002)
Internal fragmentation of the school design	<ul style="list-style-type: none"> • Fragmentation of knowledge domains within the same school (Clark, 1983; Weick, 1976) • Disconnection between subunits and between hierarchical levels (J. W. Meyer & Scott, 1983; Mintzberg, 1979)
Fragmentation of the external environments	<ul style="list-style-type: none"> • Schools micro constituents in multi-level societal institutions (Scott & Meyer, 1991) • Schools members in organizational fields, in their local communities and business life (Busher, 2006; Busher & Barker, 2003)

These causal themes reflect broad phenomena that occur at different organizational levels of the school. Some explanatory factors have their origin in different parts of the school’s environment, whereas others lie in the complex core technology. The origins of the loosely coupled schools are therefore a joint enterprise of endogenous and exogenous factors.

2.4.1 The uncertain technology of student learning

An important inference drawn from the reviewed evidence is the uncontrollable and unpredictable nature of the school’s core technology (J. W. Meyer, 1992b). The human input, i.e. the intake of students, seems to be uncontrollable, regarding their cognitive, behavioral and motivational preconditions. These conditions create, metaphorically speaking, a state of ‘legalized disorder’ (J. W. Meyer et al., 1992).

Weick (1976), in a similar vein, argues that the school’s core technology is extremely uncertain, which is a major source of loose couplings. Moreover, teaching technology is described as private and abstract in its nature (Brunsson, 2002). As argued by James D. Thompson: “The technology of

education rests on abstract systems of belief about relationships among teachers, teaching materials, and pupils” (Thompson, 2004, p. 19). From another stance, school effectiveness research has demonstrated a difficult chain of causation involved in schooling (Gray, 2004). School effectiveness research, based on large data samples, and advanced meta-analysis has suggested that the most significant explanations of student achievements reside outside of the school²⁰ (Hallinger & Heck, 1996; Witziers et al., 2003). The image of an uncontrollable input side is further amplified by variation in the students’ cognitive and behavioral preconditions across student cohorts, in terms of variation from one year to another. In public school systems, where applicants are granted statutory rights to access the school, the intake mechanism thus, produces conditions that are difficult to predict. Another source of uncertain technology lies in considerable time lag between means and ends. It takes time from when an instructional method is exercised until effects are visible. The portfolio of possible causal factors for variation in student achievements is therefore widespread and takes the form of a complex chain²¹. Possible avenues of influence from the administrative hierarchy on the core technology are therefore, at best, complex, indirect and fuzzy (Hallinger & Heck, 2003).

2.4.2 Fragmented internal environments

Internal differentiation and fragmentation is a central property of most academic organizations (Scott, 2003), which again constitutes a major source of loose couplings. The core logic of professional bureaucracies is grounded on the recruitment and of highly trained professionals, and they are given considerable autonomy in the daily work (Mintzberg, 1979, p. 333). Besides, they possess the necessary skills to plan the daily work operations, and coordination as such, is mainly based on standardization of skills. In his seminal work, Burton C. Clark (1983) has argued that this signature characteristic is a function of a highly specialized and differentiated knowledge structure that is found in most academic organizations, even in the less developed and advanced ones. As argued:

²⁰ The largest amount of explained variation is found in the exogenous group of factors clustered round the student’s socio-economic status, abbreviated SES (Leithwood, Louis et al., 2004).

²¹ In advanced designs of school effectiveness studies, in order to explain variation in student outcomes the number of independent variables, is grouped into more than ten broad arrays (Leithwood, Louis et al., 2004).

An academic system works with materials that are increasingly specialized and numerous, knowledge-intensive and knowledge-extensive, with a momentum of autonomy. This characterization applies most strongly to advanced systems, but even the most retarded systems will be based on a half-dozen or more distinct bundles of knowledge that have their own internal logics and inherent bent toward autonomy (Clark, 1983, p.16)

Clark's (1983) point is that the internal diversification and fragmentation of academic specialization create distinct knowledge boundaries. Moreover, these knowledge boundaries will typically overlap with functional subunit boundaries, such as subject departments, institutes and other disciplinary units. The consequence is often loose couplings, manifested in lack of horizontal integrations at the operating level. The reviewed literature also shows that secondary schools, across several national systems, are characterized by a fragmented and diverse internal knowledge structure: "The realm of academic departments in secondary schools represents a considerable range of organizational differentiation" (Busher & Harris, 1999, p.309).

Norwegian upper secondary schools are typically structured in a combined design, reflecting a diverse collection of both academic fields and vocational training specializations (Iván, 1998). The bedrock principle of assembling vocational training and academic gymnasium schooling in one school, physically as well as organizationally, has been at the heart of the sector policy since the mid-1970s. Not surprisingly, the structuring of vocational training and academic schooling side by side in separate subunits shapes a fragmented internal landscape when it comes to knowledge domains (Nylehn & Presthus, 2001). In consequence, it must account for significant variation in logics of action across the range of internal subunits and fields of specialization. The underlying motive among policy makers has been strongly influenced by core values of the unified school institution (Tjeldvoll, 1998), where an imperative was to construct a unified sector across former demarcations (Opheim, 2004). In that sense, the typical Norwegian upper secondary school design is influenced by an ideological 'design parameter'. The important analytical point is, however, that this school prototype is not only a large and complex organization. It also represents a close to an extreme form of a loosely coupled organizational system.

2.4.3 Fragmented external environments

Fragmentation of the external environments is one of the most frequently observed origins of loose couplings in schools (Ogawa et al., 1999). The school's environments are populated by numerous parties and interest groups with their own agendas of schooling. Schools therefore must live with incompatibilities between different sources of external pressures. A basic premise for understanding the fragmented nature of the school's external context lies in the distinction between technical and institutional environments (Scott & Meyer, 1991; Thompson, 1967). New institutional theorists argue that most organizations have *both* a technical and an institutional environment, from which fundamentally different demands and expectations are imposed (DiMaggio & Powell, 1991). In a similar vein, most organizations have to adapt their actions to both kinds of environments to a weaker or stronger degree.

The term *technical* denotes that the external demands imposed on the organization exert strong and direct influence on the production process. These demands can be relatively easily understood and imposed on the production core, although it may be costly to do so. Technical demands are, thus, possible to assess relatively precisely. Moreover, stakeholders of technical environments are typically in a position where they are capable of guiding their demands with a number of sanctions, positive as well as negative ones. For example, customers can terminate their relationships with a business firm. Production companies and commercial service producers are primarily subjected to strong technical requirements with varying, but in most terms, weaker pressures to conform to societal norms (Scott & Meyer, 1991).

On the other pole, most professional bureaucracies (Mintzberg, 1979), i.e. law firms, auditing firms, universities, schools and churches are proposed to operate in strong institutional and weak technical environments. The term *institutional* denotes that external demands are mostly grounded on culturally derived goals, professional norms and societal ideologies, i.e. belief systems that are taken for granted (Scott, 1995). Demands from these environments take the form of standardized social categories²², for example about how schools are expected to hire teachers. They form a basis of socially approved

²² As noted by Rowan and Miskel (1999): "Schools were staffed by standardized types of teachers assigned to teach standardized types of curriculum to standardized types of students in standardized types of schools" (Rowan & Miskel, 1999, p.363). This implies that if a teacher is capable of meeting socially recommended categories of schooling, he or she is regarded as competent, whether or not the candidate is capable of teaching effectively.

categories, although underspecified, that schools, churches and universities are expected to conform to, but that will only marginally influence the core activities. On these premises, a typology of four environmental relationships is shown by the model in figure 2.1.

Figure 2.1: Technical and institutional environments

		Institutional Environments	
		Stronger	Weaker
Technical Environments	Stronger	(1) Utilities Banks General Hospitals	(2) General Manufacturing Pharmaceuticals
	Weaker	(4) Mental health clinics Legal agencies Schools Churches	(3) Restaurants Health clubs

Source: Scott and Meyer (1991, p. 124)

In the first quadrant, utilities, airline companies, banks and hospitals are subject to highly developed technical *and* institutional pressures. They are expected to deliver efficient and effective service production, and besides, they must conform to procedure. Banks, railways, airline companies are strategic instruments in national policymaking. They carry out tasks that combine complex technical requirements with a strong ‘public good’ component. Production companies in the second quadrant are primarily subjected to strong technical requirements from the marketplace and from regulating authorities. Traditionally, they have only been pushed towards conformity to societal norms and values to a weaker degree, although business firms must also side to some extent with their societal reputation (Brunsson, 2002).

The dominant conception of contemporary organization theory presumes that schools are archetypical cases of organizations that succeed and persist as a result of conformity to institutionalized demands in their environments (J. W. Meyer & Rowan, 1977). The demands imposed from institutional environments take the form of socially approved standards and categories that define a set of conforming norms about what appropriate schooling is (Scott, 2000). These socially constructed categories do not necessarily inform effective schooling, rather they reflect societal theories of how to best organize education in modern society (Rowan, 2002a). The demands are derived from cultural belief systems, some are requirements enforced by teacher trade unions, e.g. tenure rules, and some are mandated by state legislation, e.g. certification and accreditation requirements. The organizational logic of schooling is conceived as a social enterprise that depends crucially on maintaining the public's confidence and legitimacy.

The typology indicates that most organizations can be classified into a dominant category of either technical or institutional environments. However, this does not mean that the categories are mutually exclusive. As underscored, "it is important to stress that technical and institutional environments should not be viewed as mutually exclusive states: they can and do coexist" (Scott & Meyer, 1991, p.123). In addition, a business firm must be open to public view, in a way that ensures it a minimum of societal legitimacy. It has to "espouse goals which show that it wishes the world in general well" (Brunsson, 2002, p.6). In more recent theorizing, Rowan and Miskel (1999) suggest that the qualitative break between institutional and technical environments should be nuanced. Vague and ambiguous institutional rules may develop a technical character over time. When, over time, a demanded instructional practice becomes more specific and attached to outcome assessment, substantial effects on classroom activities can be predicted.

It is also suggested in micro political theory (Busher & Barker, 2003), that factors expected to exert technical influence on schooling encompass preferred pedagogical styles, preferred aspects of the curriculum to teach, resource allocation, e.g. time available for teaching, criteria and rules for intake, rules for how students are grouped into classes and assessment procedures (Busher, 2006, p.54). In consequence, intake policy and rules for grouping of students may exert strong technical influence on classroom conditions. The argument is self-evident simply because criteria for grouping of students strongly determine the work conditions in the classrooms. It has for example, been argued that when the number of disabled students in so-called normal classes increases, the result is a more diverse, heterogeneous and complex technical core (Midthassel, 2004).

2.5 Response strategies in loosely coupled systems

The reviewed literature highlights *three* major response strategies to loose couplings that closely fit the research problem of the thesis: Shared values, enhanced leadership and local adaptation (Orton & Weick, 1990). *Firstly*, shared values are an important factor for building cultural homogeneity (J. W. Meyer & Rowan, 1991). Cultural integration is fostered through emerging collective acceptance of shared beliefs, shared sense of purpose and core assumptions (Marks & Louis, 1999). *Secondly*, the leadership dimension counts for a potential agency contribution in compensating for loose couplings. The reviewed literature has for example demonstrated that shared understandings in concert with strong and facilitating leadership are hallmarks of schools with a high capacity of organizational learning (Marks & Printy, 2003; Silins, Mulford, & Zarins, 2002). In a loosely coupled school context, a major portion of the leadership contribution is enhanced from the micro level, which is the operating territory of middle managers (Harris et al., 1995). *Thirdly*, micro political perspectives have suggested that local adaptation, most often in the form of external community relationships, may be effective vehicles in school improvement (Goldspink, 2007). The focus on local adaptation implies a shift in level of analysis to micro, and implicitly, the subunit level is approached as an adaptive system. Local adaptation in a loosely coupled system, in a similar vein, brings leadership practice of middle managers to the forefront. Thus, the suggested strategies are strongly interconnected through the chosen research problem and unit of analysis.

2.5.1 Shared values, beliefs and understandings

Widely shared values, understandings and sense of purpose in schooling are upheld as possible “means to compensate for loose coupling” (Orton & Weick, 1990, p.212). The underlying logic presumes that if uncertainty about the mean-end structure widely exists, agreements about preferences may be an effective compensation - in order to bring cohesiveness and coherence to the organization. As pointed to by Deal (1985), tight cultural couplings may counteract loose couplings between policies and actions, and between structural units. Meyer and Rowan (1991) argue, in a similar vein, that loosely coupled schools are not anarchies, because they build up a cohesive force through shared cultural values, labeled “the logic of confidence and good faith” (J. W. Meyer & Rowan, 1991, pp.58-59). It is exactly through this core of shared values, norms and beliefs that “day-to-day activities proceed in an orderly fashion” (ibid, p.58). This line of

argument confirms that the dialectical nature of loosely coupled systems, because tight couplings on cultural dimensions can compensate fairly well for loose couplings shaped by structural fragmentation (Deal, 1990).

Shared values are also at the heart of the theory of professional community (Bryk et al., 1999; Louis, Kruse, & Marks, 1996). The umbrella construct describes cultural traits of the teaching corps through the categories of shared visions, professional collaboration and strong student-orientation (Marks et al., 2000, p.244). Research into the construct has thus suggested that the presence of strong professional community in schools can enhance teachers' abilities to deliver effective, authentic instruction and may result in increased levels of student learning (Björk & Gurley, 2003; Wiley, 2001). Empirical manifestations are strong agreements among teachers on the definitions of good teaching (Marks & Louis, 1999), widely shared local norms about what is appropriate teacher role behavior and shared sense of purpose of schooling (Mulford & Silins, 2003). The point of the professional community is that teachers reflect together on the technical aspects of their teaching, and thereby they come to own in common a shared cultural basis as the consequence of their joint work (Björk & Gurley, 2003). The reviewed evidence supports the notion of this shared cultural basis as an integrative counterforce to loose couplings within the school organization (Hallinger & Heck, 2003).

2.5.2 Enhanced leadership

The reviewed literature consistently recommends that enhanced leadership practices can compensate for loose couplings in educational organizations (Orton & Weick, 1990). Two theoretical frameworks of educational leadership provide partial contributions to the understanding of this complex avenue of influence. The first stream sees transformational leadership²³ practices by school principals as a significant factor in cultural integration (Leithwood, 1994), as well as a driving force for promoting organizational learning in schools (Marks & Printy, 2003; Mulford & Silins, 2003). The transformational style facilitates cultural integration across the diverse school landscape, in terms of promoting shared understandings, beliefs,

²³ With its roots in general leadership theories (Bass & Avolio, 1994; Yukl, 2004), the transformational model is conceptualized in three areas of leadership practices: Setting direction by developing a shared sense of purpose, developing people by individual support and intellectual stimulation, and redesigning the organization at the purpose of realizing the vision of the school (Leithwood, 1994; Leithwood & Jantzi, 1999; Leithwood, Jantzi et al., 2004)

values and attitudes that cross internal boundaries (Leithwood & Louis, 1998). Research on transformational leadership practices picture a cluster of mediating factors, through which principals may indirectly influence desired effects (Leithwood & Jantzi, 1999).

The second stream of theorizing about effective school leadership focuses on leadership practices by middle managers (Bennett et al., 2003; Harris et al., 1995). This intake offers a complementary perspective on how schools can enhance effective leadership, specifically at the local level of the organizational system. As previously laid out, the thesis specifically addresses the middle manager's integrating role at the micro level of secondary schools (Busher, 2005a; Busher & Harris, 1999). Because of their unique boundary spanning role in the school hierarchy, middle managers are uniquely positioned to exert *direct* influence on their professional environments (Briggs, 2005). They may therefore provide tighter couplings through participative engagements with their teacher colleagues (Harris et al., 1995).

Besides, secondary school middle managers are ordinary teachers in a minor position, which is a complementary source of legitimacy for exerting leadership. In the Norwegian mainstream design, middle managers also hold ordinary membership in the school management team (Paulsen, 1999c). This mixed position, professional teacher and line manager, may provide an extra source of professional influence on work environments, although role stress also may emerge as a side effect (Wise, 2001). Moreover, research into middle management in hospitals suggests for example that this form of role duality, i.e. professional and formal manager grant access to professional networks (Floyd & Wooldridge, 1999). The thesis therefore sees the middle managers in the upper secondary school design to be favorably positioned to fill gaps determined by loose couplings. Thereby, it is implicitly proposed that enhanced leadership is embodied most effectively from the middle of the school hierarchy.

2.5.3 Local adaptation

Karl E. Weick argues in his seminal work that a loosely coupled system may be a good system for local adaptation (Weick, 1976, pp.6-7). Conversely, local adaptation may be an effective response strategy to deal with various forms of loose coupling. This twin-argument is in line with the notion of local rationality (Cyert & March, 1992). Local rationality denotes a tendency of the organization to factor its problems into sub-problems, and assign them to local subunits in order to reduce conflicting goals to manageable problems

(Cyert & March, 1992, p.165). The technical work of schooling is typically surrounded by vague, under-specified and ambiguous goals, routines and structures (Berg, 1993). In consequence, the standard repertoires do not often offer appropriate solutions to the daily stream of practical problems related to instruction. Gaps and mismatches occur and re-occur regularly, and local adaptation therefore emerges as a rational response strategy.

When school subunits are loosely coupled to each other, then any one subunit can adjust and modify its local routines, in order to solve problems, without affecting the whole school (Weick, 1976, p.7). There is, therefore, more room at the local level for self-determination and local variation by the actors: Teachers, students, and middle managers on 'street level' may adapt to external demands without affecting other knowledge domains. And conversely, trouble spots may be isolated to local units (Cyert & March, 1992). Although loose couplings produce a series of coordinative problems, gaps and mismatches in the technical core of schooling, they also inhibit enabling conditions crucial for adaptive learning²⁴. Space for local variation, i.e. loose couplings to higher-level control systems, may be a significant factor in the promotion of exploratory learning (March, 1991). Loose couplings create room for local actors to allocate more time and resources towards risk taking, trial and error efforts and experimentation of new practices (March, 1994a) or new combinations of old ones. And middle managers may promote the development of their territories as adaptive systems through creating rooms for experimental learning (Floyd & Wooldridge, 1997).

In the fragmented and diverse Norwegian upper secondary school design, it is therefore possible to undertake changes in one subunit without disturbing the others. It may for example be possible to adapt the subunit of electrical trades to the external demands of working life without affecting the departments of general academic subjects, and vice versa. The subject specialist, or trade specialists, may adapt their technical cores to different external environments (Busher & Barker, 2003). The thesis shares this conception of the micro level as the focal unit of analysis for problem-based adaptation. The loosely coupled system perspective sees large upper secondary schools more like 'holding organizations' built on loosely interconnected subunits (Busher, 2006). Most likely, adaptation patterns may be shaped differently across those subunits, simply because the professionals, firstly, relate their activities to different parts of the environments (Thompson, 1967), and secondly, that the subunits hold

²⁴ Nonaka (1994) draws the inference that variation, local autonomy and redundancy of information and knowledge, i.e. all manifestations of loose couplings, are crucial enabling conditions for adaptive learning.

distinct different local capacities, or so-called 'engine rooms' (Gray, 2004). A school strategy that cultivates local adaptation may finally make considerable sense. Local adaptation is therefore not only a possible way of pursuing organizational rationality in loosely coupled organizational system - rather it emerges as the most effective strategy. As strikingly argued by James G. March, the strategy of local adaptation benefits from "gaining the informational and motivational advantage of using people with local involvement and knowledge, at the cost of accentuating problems of central coordination and control" (March, 1994a, p.193).

2.6 The field of investigation

Rooted in the previous discussion of technical versus institutional environments, the thesis assumes that vocational training institutions have to deal with *both* institutional and technical demands from their surrounding environments. These fundamentally different types of demands are, furthermore imposed from different domains in the environments. Vocational schools are expected to be confronted with demands from local working life stakeholders, simply because they operate in local business communities populated by heterogeneous working life actors.

Bearing in mind the distributed curriculum structure of Norwegian vocational training, workplace stakeholders are in a strong position to exert technical influence on schooling. This is the case when workplace demands are focused on preferred work processes and output categories (Scott & Meyer, 1991). Assessable output categories are for example the students' motivational and behavioral standards alongside their level of skills. Workplaces are positioned to assess these standards through praxis rotation periods during the two first years of the training program. Moreover, the assessments can be sanctioned by acceptance or non-acceptance when the candidates apply for an apprenticeship contract. Nevertheless, technical demands from the workplace may also take the form of prioritized work processes, for example by demanding that the school put more emphasis on behavioral components of the instruction. A crucial point in the determination of the external demands is therefore whether they can be guided by the use of power instruments²⁵. When this happens, the students'

²⁵ When for example the surrounding local workplaces do not regard the instructional methods, standards and priorities to be appropriate, the stakeholders can reduce or even eliminate their intake to apprenticeship (Grøgaard, 2006)

training chain is broken, so to speak, which in itself represents a strong case of technical influence.

The previous line of argument does not say that vocational schools are not influenced by dominant norms and belief systems found in the larger school institution²⁶ (Scott, 1995). From the institutional environments, influence must be expected from the normative and cultural-cognitive pillars. In particular, norms of inclusive schooling are proposed to find strong resonance also within the vocational field. These social categories are key components of the unified school paradigm (Lauglo, 1998), which for several decades in Norway has gained hegemony in a strong coalition of professional associations, trade unions and politicians (Welle-Strand & Tjeldvoll, 2002). Normative categories derived from the unified school paradigm are for example social obligations and commitment to inclusive intake policies. In the Norwegian context, inclusive intake norms are paired with the bedrock doctrine that all kinds of students, independent of their social, cognitive or behavioral status, shall be grouped into the same class together with other members of their cohort. Streaming and leveling are, thus, typically seen as inappropriate among Norwegian school professionals (Welle-Strand & Tjeldvoll, 2002). Moreover, this normative foundation is supplemented by a strong emphasis on meeting the needs of all kinds of students, independent of their preconditions and cognitive status, through individually tailored aid programs (Opheim, 2004).

External demands therefore arise from both the broader school institution and local working life communities. To the latter point, the organizational field concept describes in general terms an inter-organizational community that is grounded on a common meaning system, and whose participants interact more frequently and fatefully with one another than with actors outside the field²⁷ (Scott, 1992). Applied to the study of education, the organizational field constitutes a level of analysis 'between' the educational system itself and the school organization (Hanson, 2001). The boundaries are negotiable and changing, and the collection of participants is also changeable. Over time, well-defined coalitions and power-centers are also identifiable within organizational fields. Firms and public sector services of

²⁶ Scott (1995) defines a multi-level social institution, of which the educational system is a case, by means of three pillars, respectively the regulatory, the normative and the cultural-cognitive. The latter encompasses belief systems and ideologies that have gained hegemony among the dominant coalition of the educational institution.

²⁷ The organizational field is defined by the interactions among heterogeneous players within an identifiable context. Most typically the field is locally or regionally constituted (Galaskiewicz, 1991; Scott, 1992). The actors are bound together by their interactions not by structural position (Scott, 2000)

the school's surrounding civic community, along with local and regional industrial associations and civil service bodies, then populate occupational fields in a local working life context. It is furthermore fair to assume that that the power-centre of this field is the local working life institutions. A side effect of membership in local organizational fields is blurred external school boundaries (Busher, 2006). They are flexible and semi-permeable, which again may support the flows of knowledge and resources across them. Membership in local fields is therefore both a source of constraints and a reservoir of possible response strategies.

The analytical point of the theory review proposes that within the field of investigation, Norwegian vocational training, various forms of demands imposed from fundamentally different external environments must be expected. *Firstly*, vocational training units are micro constituents in the larger unified school institution of Norway. In consequence, the possibility must be taken into account that school actors are heavily influenced by dominant norms and belief systems. *Secondly*, besides normative and cultural influence from the larger school institution, it is likely that vocational training managers are confronted with strong technical demands from their environments. Local fields populated by school actors, business firms and workplaces are conceptually close to Thompson's (1967) notion of task environments. From these environments, technical demands are imposed on the production core of the organization: They refer to assessable school deliveries that are guided by effective sanctions. *Thirdly*, the logic of local adaptation then boils down to finding an appropriate balance between these fundamentally different demands through the allocation of resources, attention and facilitating actions.

2.7 Summary of perspectives

The chapter has aimed to review theories of the school organization, clustered round the notion of schools as loosely coupled systems. Specifically, implications for the research problem and the empirical field of investigation are explicated. The review has, thus emphasized the theoretical illumination of characteristics found in large, complex schools, of which the Norwegian upper secondary school is an archetypical case: Complex and fragmented environments, multiple, although stronger technical demands paired with high levels of internal fragmentation. The latter aspect is not at least a function of the combined design of the Norwegian upper secondary school. The literature reviewed pinpoints three broad propositions that are crucial for understanding the research problem as well as the empirical

context: *Firstly*, vocational training institutions operate in multiple external environments. They are, on one hand, micro constituents of the larger public school institution, which justifies the assumption that some influences from the dominant norms and taken for granted assumptions are exerted. Most of these norms and beliefs are assumed to cohere round the paradigmatic understanding of inclusive schooling (Tjeldvoll, 1998). On the other hand, vocational training institutions are also players within local organizational fields (Scott, 1992) populated by partners involved in vocational training. From these local environments, mostly technical demands are imposed on schooling. School managers and teachers on the local level of this school context therefore must face a series of external demands mostly of a strictly technical nature.

Secondly, the review points to the inference that the theoretical accounts of loose coupling generally also apply to Norwegian upper secondary schools. Social origins of loose couplings are both external fragmentation and a high level of internal fragmentation, due to the assembling of both academic schooling and vocational training within the same organizational design. Moreover, strong traditions of individual teacher autonomy produce invisible contracts and decoupled classrooms. The reviewed literature, *thirdly*, points to local adaptation paired with enhanced micro level leadership as potential adaptive instruments. Middle managers of the subunits are obviously key actors in leadership action towards the technical core of schooling. Local adaptation is not a single enterprise, since local school managers and their teachers are faced with external demands of a partly incompatible nature. The crux of local adaptation is therefore a balancing act between, on one hand, practicing commitment and social obligations to broader institutional demands along with mastering technical expectations from the workplaces on the other. The two most important implications are, however, micro-level management and local adaptation, which are both a local and an outward-looking perspective on organizational learning. The middle management and leadership side is subject to review in chapter 3, whereas adaptive learning is elaborated upon in chapter 4.

Chapter 3: Literature review on middle management

3.1 Introduction

The purpose of this chapter is to construct a theoretical framework of middle management practices related to adaptive learning in school organizations. Research that may advance the understanding of the middle manager's agency contribution has thus been subject to the review process. Since there is no coherent theory applicable for the phenomenon in question, search in diverse areas of the organizational literature has been made²⁸. The chapter is therefore eclectic in nature, although the main part of the reviewed publications presents evidence from a typical professional bureaucracy context (Mintzberg, 1979) - hospitals, colleges and secondary schools. The underlying assumption is that the middle management phenomenon encompasses general properties as well as context-specific ones (Currie & Procter, 2005). The definition of the lower boundaries of middle management has, for example, shown to be context specific, and conceptual variation is found across different studies (Pinsonneault & Kraemer, 1997). The term 'middle manager' is thus used differently in the management literature, and it is therefore important to define who we are talking about when discussing the 'middle manager' (Currie & Procter, 2001, p.109).

The most used definitions of middle management build on Thompson's (1967) distinction between three levels of the organization, respective the technical, managerial and institutional. Middle managers, then, "perform a coordinating role where they mediate, negotiate and interpret connections between the organization's institutional (strategic) and technical (operational) level" (Floyd & Wooldridge, 1997, p. 466). This mediating role constitutes a significant potential for exerting social influence downwards as well as upwards (March & Simon, 1993). From their mediating position, middle managers also operate the external boundaries of the organization, for example through regular contacts with customers and suppliers (Thompson, 1967), stakeholders (Mintzberg, 1993) and the local civic community (Busher, 2006). These general properties are found in most organizational prototypes (Mintzberg, 1979).

²⁸ Electronic search in management databases, EBSCO and First Search, has been made by using different search keys. Additionally, manual search in a sample of ranked educational management and leadership journals, paired with books and book chapters, have contributed to the sample. Included in this latter group are published reviews on middle management in schooling (Bennett et al., 2003). The main part of the theoretical sources is drawn from research on middle management in a professional bureaucratic context (Mintzberg, 1979).

3.2 The middle manager of education

In the Norwegian design, middle managers of upper secondary schools occupy a formal position of authority at the interface between the principal and the teachers²⁹. Their administrative tasks and responsibilities typically encompass management of the human resources within the subject department, paired with coordinative responsibilities, budget administration and instructional planning (Dimmen, 2000). And similar to what is found in most professional bureaucracies, middle managers of education are also teachers in a minor part of their tenure position (Paulsen, 1999c). Possible avenues of social influence are thus rooted in a seemingly inconsistent work role, where the incumbent is both superior and professional colleague. Needless to say, role conflict, role ambiguity and tensions are frequently observed characteristics of this duality in the work role (Bennett et al., 2003; Wise, 2001). Moreover, middle managers in secondary schools are not managerial generalists, but typically specialists in subject knowledge, didactics and pedagogy within their specific knowledge domains (Harris, 2000). Their basis of expertise and legitimacy is, as such, grounded on professional knowledge (Blandford, 1998b; Clegg & McAuley, 2005).

Two context specific properties of Norway are worthy of comment. *Firstly*, the middle manager of Norwegian upper secondary schooling is also typically a full member of the management team at the top of the hierarchy. This design component was deliberately chosen by the governance system in the mid-1990s (Paulsen, 1999b), with the purpose of downplaying the tendency that middle managers typically see themselves solely as department advocates. Moreover, access to the top of the school hierarchy ensures regular interactions with the central management core. *Secondly*, especially within the vocational training field, the middle manager is responsible for keeping up regular relationships with the external workplaces involved in apprenticeship training. These two attributes underscore the strong boundary spanning side of the middle manager's work within the given research context: Since the middle manager holds membership both at the top and the

²⁹ The emphasis on formal managers at the middle level excludes other actors from the 'theoretical universe' of the study. In the contemporary educational leadership literature, the term 'middle leader' has gained wide acceptance. The term reflects a more open-ended categorization that includes for example pastoral servants, coordinators and informal leaders into the issue of middle leadership (Bennett et al., 2003; Busher, 2006). This approach does not fit well to the Norwegian context, where there is typically a clear distinction between formal managers and coordinators at the middle level of Norwegian upper secondary school (Dimmen, 2005; Paulsen, 1999b). In the Norwegian school system, middle management is, furthermore, a typical upper secondary level phenomenon (Dimmen, 2000).

bottom of the school hierarchy, he or she might span the internal school boundaries. In addition, external boundary spanning is promoted through maintaining social linkages to the stakeholders in the working life.

3.3 The boundary spanning middle manager

The term boundary spanning connotes that middle managers are engaged in a series of activities that occur at the school's boundaries. They are, *firstly*, positioned to bridge information, knowledge and objectives from different parts of the loosely coupled school design (Busher & Harris, 1999). Middle managers may thereby broker between conflicting views and interests (Glover, Gleeson, Gough, & Johnson, 1998). And when middle managers of the vocational field engage in external stakeholder relationships, they may, *secondly*, bridge external interests with their professional domain (Busher, 2005a). The thesis builds on the assumption that this multi-faceted position promotes local adaptation within the professional domain, of which the middle manager is superior. In a loosely coupled school context, this function is seen as crucial for effective educational behavior.

3.3.1 The boundary spanning concept

The boundary spanning concept is used to describe “activities that occur at organizational boundaries, including internal boundaries that separate organizational subunits” (Pawlowski & Robey, 2004, p. 648). In general terms, functional units (Thompson, 1967), teams (Katz & Allen, 1985) as well as individuals can undertake boundary spanning functions. However, most of the reviewed literature on boundary spanning portrays individual agents as boundary spanners. Specifically, the reviewed literature has highlighted the important role boundary spanners play in the internal diffusion of information, knowledge and ideas across organizational boundaries³⁰ (Schwab et al., 1985). But boundary spanning also encompasses externally oriented activities, such as scanning, mapping and constructing a picture of the environments, including predicting future trouble spots or potential allies (Daft & Weick, 1984).

³⁰ The most dominant theme in the boundary spanning literature has been boundary spanners' activities on the transfer of information and knowledge across internal boundaries. Such individuals are labelled 'gatekeepers' (W. M. Cohen & Levinthal, 1990; Tushman & Katz, 1980; Tushman & Scanlan, 1981).

The notion of the boundary spanning middle manager also builds on a dynamic and proactive view³¹ of the school boundary itself, conceived as “marketplaces where transactions take place” (Yan & Louis, 1999, p.29). For example, vocational schoolteachers and middle managers may establish a series of relationships to the outside working life domain through their work with apprenticeship training. The school boundary then becomes dynamic and flexible, but also blurred. The ‘semi-permeable membrane’ label captures this specific property of the school boundary. As stated by Hugh Busher: “These semi-permeable membranes allow for osmosis between a school and the local social and business community in which state schools are deeply embedded” (Busher, 2006, p.2). School actors then participate in discourses with their environments, which shape a context for local adaptation through ‘negotiated order’. More recent research on professional bureaucracy contexts has highlighted the boundary spanning side of middle management practices (Currie & Procter, 2005; Harris, 2000; Pappas et al., 2004). Three points are explicated in this line of research. *Firstly*, middle managers in professional bureaucracies are extensive boundary spanners (Currie & Procter, 2002). *Secondly*, it is a central expectation of middle managers that they represent their professional domain towards the external environments, for example through liaison devices (Briggs, 2003; Mintzberg, 1993). *Thirdly*, middle managers span internal boundaries vertically in a two-way fashion (Gleeson & Shane, 1999; Glover et al., 1998): From the top of the school hierarchy and into the teacher domain, and vice versa.

3.3.2 Internal boundary spanning from the middle

Due to their unique position between the top apex and the operating core, middle managers span the internal boundaries of the school (Mintzberg, 1979). The reviewed research on middle management in secondary schooling confirms this image (Blandford, 1998b; Busher, 2005a). Professional engagement in a wide array of internal forums is a prevalent characteristic of the middle management role in secondary schools (M. Brown & Rutherford, 1999; Glover et al., 1998). Due to their continuously shifting work context, middle managers engage extensively in vertical and horizontal communication (Gleeson & Shane, 1999). They are therefore, well positioned to translate and synthesize school objectives, goals,

³¹ Yan & Louis (1999) suggest a typology of boundaries as ‘demarcations’, ‘perimeters’, ‘interfaces’ and ‘frontiers’ for transactions (Yan & Louis, 1999, p. 27). Whereas two first perspectives stress the importance of protecting the system from environmental disturbances, the two latter focus on the benefits from bridging devices.

experiences and demands top-down as well as bottom-up (Busher & Harris, 1999). Internal boundary spanning, thus, emerges as a potent source of influence on implementation and adaptation (Currie & Procter, 2001). Due to their extensive access to critical information, along with the formal authority, the middle manager is therefore, favorably positioned to facilitate local adaptation: Through the creation of space for experiments, innovations, problem based learning as well as the sharing of experience and information among colleagues (Balogun, 2003; Floyd & Wooldridge, 1997). Several empirical categories found in literature on middle management in secondary schooling conform to this boundary spanning discourse. Although the conceptual frameworks vary, the findings confirm the image that middle managers in secondary schools engage in translating and communicating school aims and objectives across internal boundaries (Glover et al., 1998). Middle managers may thereby fill in and compensate for gaps rooted in a loosely coupled school design.

3.3.3 Role stress as function of internal boundary spanning

The twofold position of middle managers in schools, professional teacher paired with line manager, is, however, described as a complex double-edged role and associated with high level of role stress³² (Wise, 2001). Tensions are also described as a function of the emerging line management culture in academic organizations (Clegg & McAuley, 2005). Role stress is typically rooted in conflicting expectations between senior managers and teacher colleagues of the middle manager's subject department. Formal accountabilities of the middle management role may for example collide with a widely held belief in collegiality among teachers (Blandford, 1998a; Leader, 2004). The most striking example of this tension is the middle managers' obvious resistance to the idea of monitoring the quality of their colleagues' work, especially by observing them in the classroom (Mc Garvey & Marriot, 1997; Wise & Bush, 1999). This pattern is explained by the middle managers' wish to avoid damaging their collegial relationship to their team members, by implementation of monitoring or inspection procedures directed towards their classroom behavior (Wise & Bush, 1999). On the other hand, the middle manager is also accountable for the quality of the teaching at the department. Therefore, it is questioned how this objective is possible to reach, without monitoring and reviewing the work of the

³² Role stress is most commonly defined by two constructs, role ambiguity and role conflict, i.e. the perception among role incumbents that their role set members confront them with ambiguous and conflicting expectations. For a detailed framework, see Solli-Sæther (2006)

teachers (Mc Garvey & Marriot, 1997). Evaluation and observation are seen as necessary vehicles in supporting the teachers' work, but, on the other hand, implementation is associated with collegial 'clashes'. The tension related to classroom intervention has thus been described as a major source of role stress (Glover, Miller, Gambling, Gough, & Johnson, 1999). But role stress themes have also been associated with ambiguity and uncertainty about the middle managers' role, position and repertoire of authority (Blandford, 1998a). This category of role ambiguities is labeled 'mixed message'. Among the most frequently reported 'mixed messages' were the overload with administrative responsibilities, contrasted with the time resources to do such work in a proper manner. As stated: "This 'mixed message' places middle managers under a considerable amount of stress" (Wise, 2001, p.399).

3.3.4 External boundary spanning

Boundary spanning theory also highlights the importance that boundary spanners link their activities to external milieus (Tushman & Scanlan, 1981). Absorptive capacity research has for example shown that individuals, who operate interfaces between subunits, at the same time as they are connected to external knowledge domains, promote organizational learning (W. M. Cohen & Levinthal, 1990, p.128). When such opportunities are utilized, the boundary spanners serve both as filters and bridges between the organization and its environments (Yan & Louis, 1999). Research into middle management in professional bureaucracies has shown that middle managers play key roles at the external boundaries. They operate "between the professionals inside and interest parties – governments, client association and so on – on the outside" (Mintzberg, 1993, p.195). Middle managers maintain close relationships to outside stakeholders that grant financial support or moral legitimacy. Thus, the external roles of "maintaining liaison contacts acting as figurehead and spokesman in a public relation capacity, negotiating with outside agencies – emerge as primary ones in professional administration" (ibid, p. 195). Middle managers thereby exert substantial influence, because they construct a series of links to the outside world through their day-to-day practices. These linkages "contribute to internal sense-making, through translation of stakeholder positions, disciplining clients, justifying changes" (Rouleau, 2005, p.1438).

3.3.5 Social networking

Liaison roles, where middle managers maintain relationships with stakeholders, may also grant access to social networks, of which the participation adds supplementary channels to external knowledge and resources. Studies of middle management in hospital organizations suggest the co-existence of external boundary spanning and social network engagement to be an extraordinary source of influence at hand of middle managers (Pappas et al., 2004; Pappas, Flaherty, & Wooldridge, 2003). This line of research supports the notion of middle managers' social network *centrality* as a potential for organizational influence. The degree of centrality is defined by the number of direct relationships, i.e. social ties that an actor has with other actors in a network (Song & Miskel, 2005, p.13). Actor centrality is thus used as a predictor of organizational influence, because the network ties empower the central actors by giving them greater access to valuable information. These exclusive sources may then be a source of control over conditions, opportunities and constraints (Pappas, 2004). Pappas and Wooldridge (2002), for example, found that the number of bridging relationships maintained by hospital middle managers enabled them to facilitate adaptation.

When middle managers operate as central actors in social networks, they also increase their contributions on consensus building of the organization (Pappas et al., 2003). A high level of knowledge about internal capabilities paired with overview of external knowledge sources enable middle managers to frame the situation effectively. And their structural position enables them to take advantage of this premium knowledge in adaptive behavior (Pappas et al., 2004). The empirical evidence, although based on only a few studies, also suggests a positive relationship between the middle managers' *closeness*³³ in a social network and the level of integrative activities performed by middle managers. Integrative activities encompass the synthesizing of external information, followed by the use of it to propose initiatives. Integrative activities also include the fostering of new capabilities through making colleagues aware of new opportunities. Closeness in social networks is therefore a predictor of "information sharing among middle managers although the type of information may be different" (Pappas et al.,

³³ Closeness denotes strong social connectivity, and it is expressed in terms of network density, distance and social proximity. The underlying theory argues that to be well connected in a given social network, actors must also be connected to individuals who are also well connected. Thus, closeness is represented by the inverse of the sum of the distances from one actor to all other actors (Pappas & Wooldridge, 2002, p. 4). In consequence, if the social distance increases, i.e. closeness decreases, centrality also decreases.

2003, p. 10). The analytical point of this line of more recent research is that when middle managers engage in close networks of frequent relationships, they gain premium opportunities of influence on their professional environments. Moreover, they may thereby contribute to strengthen their local knowledge domains, i.e. their subunits, as adaptive systems.

3.3.6 Utilization and co-existence

The reviewed evidence demonstrates that middle managers work in a context of many boundary-spanning opportunities. However, as pointed to, although middle managers are granted access to a range of social locations, there is no guarantee that these boundary-spanning opportunities are utilized. The evidence therefore underscores that it is the *utilization* of boundary spanning opportunities that enables middle managers to exert social influence on their professional environments (Tushman & Scanlan, 1981). Moreover, high level of utilization of boundary spanning opportunities may fairly well co-exist with engagements in social networks (Pappas et al., 2003). The reviewed evidence, thus, portrays a twofold social ground for middle management influence: Utilization of boundary spanning opportunities paired with intense social network engagements³⁴. The reason is that boundary spanning middle managers are more likely assumed to have numerous informal and weak ties (Granovetter, 1973). Weak ties are based on many, although infrequent, interactions, which are effective vehicles in gaining access to knowledge in the external environments (Hansen, 1999). Middle managers in the vocational training field are expected to be external boundary spanners, in terms of handling professional relationships to the local working life. It could therefore be expected that, when these opportunities are utilized, they become actors of social networks bound to their common occupational domain. The analytical point is that network centrality and high level of utilization of boundary spanning responsibilities typically co-exist and provide a significant ground for professional influence.

A side effect of this dual position is that external boundary spanners may be stimulated to think deviantly about the organization's direction and current actions. Moreover, this perceptual deviance (Pappas, 2004) may help the middle managers in facilitating adaptive behavior among their professional

³⁴ The conjoint contribution is demonstrated in recent studies of hospital middle managers. Middle managers with external boundary spanning responsibilities displayed a higher degree of social network centrality than their non-boundary spanning counterparts (Pappas, 2004, p. 2).

colleagues. However, the reviewed literature also underscores that successful influence from boundary spanning requires trust, legitimacy and competence (Harris et al., 1995). As stated in the early work on boundary spanning: “Work related competence is an important determinant of boundary role status” (Tushman & Scanlan, 1981, p.96). Boundary spanning and social network centrality is, thus, assumed to be significantly promoted by the middle manager’s professional competence (Briggs, 2005; Busher, 2005a).

3.4 Towards a typology of boundary spanning roles

A number of the reviewed publications have sought to conceptualize the middle manager’s boundary spanning repertoire towards a typological framework. Scholars have for example used qualitative role dimensions as an analytical tool, aiming to order middle management practices conceptually³⁵ (Briggs, 2003, 2005; Busher & Harris, 1999; Glover et al., 1998). The role dimensions suggested in the literature capture a wide range of aspects manifested in the middle managers’ work as mediators and brokers (Harris, 2000). Two main images emerge from this body of reviewed work. *Firstly*, the evidence confirms that school middle managers employ both buffering and bridging strategies. School middle managers make deliberate choices themselves about what type of external signals and demands that are sought to be transferred to their professional domains (Harris et al., 1995). *Secondly*, the reviewed evidence also shows that multiple role dimensions are combined in the daily micro-practices of middle managers. The reviewed literature synthesizes five dimensions of the school middle manager’s boundary spanning role.

3.4.1 The bridge dimension

A number of descriptive accounts in the literature use the bridge narrative to capture the middle manager’s boundary spanning function. The term exposes two distinct perspectives of middle management practices, respective an

³⁵ Such qualitative dimensions are not entirely clear-cut in relation to each other, and some overlaps may be counted for (Berg, 1995b). Moreover, qualitative dimensions are analytical tools that cover some degree variation. As stated: “Dimensions represent to locality of a property along a continuum or range” (Strauss & Corbin, 1998, p.117). For example, a role dimension may be more or less dominant, or represent a range of levels of intensity.

internal as well as an external boundary spanning orientation. *Firstly*, the internal bridge dimension is widely described in the research on middle management in various secondary school contexts. It was for example found to be a central responsibility of UK middle managers in their work as heads of department, specifically related to downward influence, - gaining acceptance for school-wide goals and priorities (Harris, 2000). Besides, the bridge metaphor is used to describe that middle managers fill in communicational gaps between the top level and the operating core of the department. Gleeson and Shane (1999) see the bridge narrative as a way, through which middle leaders manage ambiguity, shaped by the fact that neither school professionals nor senior managers do fully understand their identity. Through a bridging repertoire, middle managers “regard achieving effective working relations with teachers and senior managers – they filter changes in both directions” (Gleeson & Shane, 1999, p.5). The main categories grouped into the bridge dimension are specified in table 3.1.

Table 3.1: Categories of the bridge dimension

CATEGORY	DESCRIPTION
Mediator of vertical levels of the school organization	<ul style="list-style-type: none"> • Downwards filtering of central management demands in a way that make them practical and acceptable in the subunits of the middle manager (Gleeson & Shane, 1999) • Upwards initiative about working agreements in order to make school priorities agreeable and possible to implement (Busher & Harris, 1999)
External bridge	<ul style="list-style-type: none"> • Maintenance of close ties to local community parties and interest groups (Busher, 2006) • Operating closeness to external stakeholders (Pappas, 2004)

As shown in table 3.1, the bridge narrative *secondly*, is also used to conceptualize external boundary spanning activities essential for the integration of knowledge across boundaries. Bridging denotes to develop, cultivate and use external linkages, in order to gain access to knowledge and information that is dispersed across the school. The social network perspective highlights that individuals that bridge across divided communities are important, since they are enabled to play a brokerage role (Newell, Tansley, & Huang, 2004, p.46). Many social linkages to the external environments enable the middle manager to bridge incompatible understandings and thereby contribute to crucial integration of knowledge

and interests. The bridge metaphor is in the educational management literature described as a transactional leadership mode, because the communicational bridge function is accompanied by allocation of resources and some use of the powers embedded in the hierarchy of authority (Harris, 2000, p.82). It captures leadership styles, through which the heads of department transform whole-school policies and senior staff perspectives into local rules that guide teaching practices. It involves “attempts to secure working agreements with departmental colleagues about how to achieve school and departmental goals and practices. Parts of this role is to the managing and allocating of resources” (Busher & Harris, 1999, p.307).

3.4.2 The translator dimension

Empirical findings have described that secondary school middle managers are engaged in communication of school aims and objectives across internal boundaries (Busher & Harris, 1999). Middle managers thereby re-interpret and manipulate information, school goals and policy derivatives. When middle managers are engaged in such tasks and responsibilities, they act as translators - editors and interpreters of vision and understandings of schooling (Glover et al., 1998). Situated learning theories define organizational translators as “individuals who can frame the interests of one community in terms of another community’s perspective” (J. S. Brown & Duguid, 1998, p.36). The conceptual core of this definition is, *firstly*, that the translation process shapes and re-shapes a learning dyad between the involved parties. *Secondly*, the term denotes that the translator must be capable of aligning contrasting perspectives through his own action repertoire. Through the re-framing of different perspectives, it is possible for the translator to contribute to re-negotiated understandings in the focal unit (Wenger, 1998).

Internal translation takes place when perspectives from the management team are introduced into teacher communities by the middle manager, and vice versa. Through translator repertoires, teacher interests may potentially be integrated around school aims (M. Brown & Rutherford, 1999). The other way around, middle managers may also filter local demands in a way that make them acceptable at the top, “so that the whole-school values and expectation take account of departmental values” (Bennett et al., 2003, p.7). Translation may also be activated by performance feedback from external stakeholders, and by the middle manager’s own access to external knowledge environments. The core of the translator function is then to synthesize the external knowledge fractions with local ones, - in order to

make propositions that may facilitate adaptability. Categories of the translation dimension are shown in table 3.2.

Table 3.2: Categories of the translator dimension

CATEGORY	DESCRIPTION
Translator of vision, policies and local perspectives	<ul style="list-style-type: none"> • The middle manager translates central policies, aims, objectives and strategies, in order to make them acceptable locally (Glover et al, 1998; Briggs, 2005) • Local perspectives are translated into the management core at the top of the hierarchy (Bennett et al, 2003)
Compensator of communicational gaps	<ul style="list-style-type: none"> • Specifies vague goals (Gleeson & Shane, 1999) • Operates communication channels between the senior levels of the school and the operating level of the department (Glover et al, 1998).
Synthesizing external feedback with local knowledge	<ul style="list-style-type: none"> • The middle manager justifies change through the synthesizing of knowledge from the professional core with stakeholder feedback, i.e. over-coding (Floyd & Wooldridge, 1997; Rouleau, 2005)

Middle managers as translators may reduce the cognitive distance between actors that have different views, understandings and interests (Cillo, 2005). The effectiveness of the translation process is dependent on a common knowledge base and widely shared understandings among partners in learning dyads (Lane & Lubatkin, 1998). It is important that the middle manager is capable of capturing the underlying organizational logics and challenges among the parties involved in the social interactions. The powerful position of the middle manager in this role also requires trust, since translation is ‘rarely entirely innocent’ (J. S. Brown & Duguid, 1998, p.37).

3.4.3 The liaison dimension

The liaison narrative describes tasks and responsibilities carried out by middle managers in order to gain information, positions, resources and knowledge in the school’s environment. Seemingly, this dimension overlaps with the bridge dimension. And it does to some extent. However, the descriptors of the liaison dimension also add supplementary value. *Firstly,*

the liaison metaphor is used to characterize a representative corporate role³⁶ (Briggs, 2005, p.39). Included is also the capacity to bargain about resources. If the middle manager is successful in this form of boundary spanning, critical resources can be imported to the focal subunit: Slack, extra funding, projects, critical information and political support. *Secondly*, cross-school communication with colleagues in neighboring subunits is also grouped into the liaison role dimension. The middle manager as liaison, thus, communicates frequently with those above in the hierarchy, but also with the professionals of other side-departments (Briggs, 2003, p.430). *Thirdly*, the liaison also connects external stakeholders with departmental activities. A signature characteristic of the liaison role in the professional bureaucracy context is the strong expectation of middle managers of being spokesperson for professional interests³⁷. A *fourth* property of the liaison dimension connotes that the agent must be unbiased and reliable. Liaising requires that the agent to some extent “is seen to be both independent and unbiased” (Schultze & Orlikowski, 2004, p.89). A brief summary of liaison descriptions in the literature is summed up in table 3.3

Table 3.3: Categories of the liaison dimension

CATEGORY	DESCRIPTION
Ambassador and spokesperson	<ul style="list-style-type: none"> Represents the subject department as external spokesperson (Mintzberg, 1993) Engagement in political activities such as lobbying for in-flow of support and resources (Ancona & Caldwell, 1992)
Middle-man and outpost	<ul style="list-style-type: none"> Neutral outpost with legitimate access to external parties and internal collegial milieus (Schulze & Orlikowski, 2004)

3.4.4 The facilitator dimension

The facilitator dimension describes the middle manager as *change intermediary*, aiming to help professional colleagues to make sense out of external feedback and change initiatives (Balogun, 2003, p.75). Helping colleagues to make sense out of confusing and complex situations related to

³⁶ Ancona and Caldwell (1992, p. 640) use the label 'ambassador' about this role, which includes both to persuade for support and resources

³⁷ The 'spokesman' (Mintzberg, 1979, 1993), describes a mixed role dimension of buffering department colleagues, searching for external resources and representing the professional domain in front of the external environments.

teaching is a frequently described category of the middle manager's work. The term *sense giving* is used to conceptualize these activities, highlighting that the point is not for the middle managers to make sense for his or her own understanding. Rather the key point is rather to *give sense*, in terms of helping others, to understanding change initiatives and demands (Gioia & Chittipeddi, 1991; Rouleau, 2005). As noted: "The managers were not only having to work their way through their own personal transition as change progressed, but also help their staff through their transitions" (Balogun, 2003, p.76).

A nested function is categorized as *facilitation of learning*. The point here is to create enabling conditions³⁸ for the middle manager's teacher colleagues, so that learning can be enhanced. Through the utilization of their access to external information, middle managers can provide their professional colleagues with new ideas, good practices or alternative solutions (Balogun, 2003, p.70). Middle managers acquire external knowledge and synthesize it in a form that makes it understandable for their professional colleagues³⁹. In that manner, they may stimulate and facilitate learning among colleagues, and help resolving problems, simply by pointing to where possible solutions may be found. Facilitating also comprises the practices, where teachers are helped and stimulated to develop their own informed theory of practice (O'Neil, 2000; Sadler, 2001). Within the same discourse, the role of middle managers is also described through "the enactment of the role as mentor, coach and guide" (Clegg & McAuley, 2005, p.22; Floyd & Wooldridge, 1997).

A *third* category of the facilitator dimension is quality initiatives taken, in order to create enabling conditions for adaptive learning among teachers. Such quality initiatives encompass workshops for teams, the allocation of resources for projects that provide learning opportunities, buying time, and providing a 'safe haven' for professional colleagues to carry out experimental programs for experimentation and learning. The facilitator role is thus also to "relax regulations to get new projects started" (Floyd & Wooldridge, 1997, p.467). And middle managers are in a position where

³⁸ The multi-faceted concept of enabling conditions plays an important role in knowledge management theories. See Nonaka & Takeuchi (1995). Such enabling conditions for local learning are for example autonomy, variation, redundancy, 'creative chaos' and motivational drives among individuals (Nonaka, 1994)

³⁹ In the knowledge management literature, the facilitator role is described by such metaphors as designer, teacher and steward (Senge, 1990). As stated: "Leaders who are designers, stewards, and teachers see their core tasks as that of bringing about creative tensions by highlighting the gap between reality and vision" (Sadler, 2001, p.423). Facilitator roles are argued to help people in the group to see the big picture, which is an element in Senge's (1990) notion of systemic thinking.

they can use their external contacts to form project boundary crossing projects and thereby “encourage fledging projects within their own department to help facilitate adaptability” (Balogun, 2003, p.70). An overview of the facilitator dimension is presented in table 3.4.

Table 3.4: Categories of the facilitator dimension

CATEGORY	DESCRIPTION
Facilitator of learning conditions	<ul style="list-style-type: none"> • Supervision of professionals close to their actions (Clegg & McAuley, 2005) • Helping teachers to de-abstract conceptual knowledge and develop their own theory in practice (O’Neill, 2000)
Promoter of quality initiatives	<ul style="list-style-type: none"> • Arranging workshops and forums for solutions, brainstorming and ideas (Balogun, 2003) • Formation of projects that fledge opportunities for learning (Balogun & Johnson, 2004) • Creating ‘safe havens’ for experimental learning based on trials (Floyd & Wooldridge, 1997)
Change intermediary	<ul style="list-style-type: none"> • Sense-giving though helping people to make sense out of confusing and complex situations (Balogun, 2003; Balogun & Johnson, 2004; Rouleau, 2005)

As argued by Floyd & Wooldridge (1997), the facilitator role of the middle manager is strongly associated with adaptability. Through the employment of a facilitation repertoire, a series of learning opportunities may be created - which support adaptation.

3.4.5 The broker dimension

The broker dimension, as used in the reviewed literature, describes a more active and transactional mode of middle management practices, which is associated with more intense engagement and interference. The literature points to this dimension as stable constituent of the educational middle manager’s role. As stated, the “bridging and brokering function remains a central responsibility” (Busher & Harris, 1999, p.307). A knowledge broker is a generally understood as boundary spanner who engages in the integration of knowledge, by multi-membership and thereby being capable of transferring “some element of one practice into another” (Wenger, 1998,

p.109). The empirical categories cluster round multiple participation and active transformation in operational changes, as listed in table 3.5

Table 3.5: Categories of the broker dimension

CATEGORY	DESCRIPTION
Multiple participator	<ul style="list-style-type: none"> • Middle managers participate in practices in the management sphere and professional milieus (J. S. Brown & Duguid, 1998; Glover et al., 1998; Wenger, 1998) • Brokering back to the top of the hierarchy when school policies collide at the bottom (Briggs, 2003).
Transformer of operational change	<ul style="list-style-type: none"> • Interference into professional teacher communities within the middle manager's domain, in order to implement changes (Glover et al., 1999) • Transactional style with use of authorities over teacher colleagues (Busher & Harris, 1999; Harris, 2000)

Brokering involves, *firstly*, knowledge about the situated context at both sides of the learning dyad. *Secondly*, the broker also engages actively in the focal unit, in order to implement new perspectives into practical action. The dimension is used to describe active interference in for example teamwork, based on the broker's own perceptions, interpretations and judgments. As argued by Glover et al (1998), the broker repertoire embodies a transactional style, through using power over others. Resistance to change, lack of political will, dysfunctional practices, ignorance and lack of skills may be situations that call for a broker repertoire. Busher & Harris (1999), for example, use the broker dimension to describe situations where middle managers mediate whole-school imperatives into performance tasks, to which individuals can relate. And conversely, if this is not possible, they may 'broker' back to the senior management at the top of the school hierarchy in order to modify the policy (Briggs, 2003, p.424). Since active participation requires expertise, trust and legitimacy, the middle managers must be trustworthy professionals. Well-performing middle managers are "leading professionals in the sense that their own mode of practice was regarded as the model to follow" (Harris et al., 1995, p.288). It means that the middle managers as brokers directly influence practical solutions. Since the broker engages in practical dialogues, negotiations and problem solving together with the teachers, this mode of middle management practices must

be regarded as intense. Not only does this mode call for legitimacy and trust, the broker must also face the consequences of his or her engagements. Brokers who “participate in both worlds, are subject to the consequences of the message they carry” (J. S. Brown & Duguid, 1998, p.37).

3.4.6 Managing loose couplings from the middle

The essence of the reviewed literature assumes that middle managers of school organizations undertake critical functions in a loosely coupled context. The argument is supported by a well-documented line of evidence drawn from different strands of middle management research (Bennett et al., 2003; Floyd & Wooldridge, 1997; Harris et al., 1995; Mintzberg, 1993). Due to the middle managers’ multiple accesses, they are promoted to synthesize and integrate fragmented knowledge, and thereby to propose initiatives among their professional colleagues. Moreover, since middle managers are also professional themselves, they are uniquely positioned to perform a series of facilitating roles. And the formal authority as unity of command of the subunit allows the middle manager to perform a direct and intense broker role through a transactional repertoire. A summary of the dimensions drawn from the literature is presented in table 3.6.

Table 3.6: Categories and role dimensions of academic middle management

ROLE DIMENSION	IMPACT ON ADAPTIVE LEARNING
Bridge	<ul style="list-style-type: none"> • The middle manager as bridge fosters adaptive learning through ensuring connectivity between the teacher core and the external stakeholders • Social ties to stakeholders in close interactions and joint engagement with the business life
Translator	<ul style="list-style-type: none"> • The middle manager in translation re-frames, edits, manipulates and communicates school aims, stakeholder performance feedback and policy elements between parties in a dyadic relationship • Translation of information and experiences between management team and teacher teams
Liaison	<ul style="list-style-type: none"> • The middle manager in liaison devices represents the professional domain towards external stakeholders • Corporate ambassador that advocates school interests in the workplace domain • Also a neutral and unbiased liaison officer • Communicates side-ways to other subunits
Facilitator	<ul style="list-style-type: none"> • Sense-giving though operating as provider of knowledge and advisers • Ensuring enabling conditions and a safe garden for experimenting • Ensuring enabling conditions for professional learning • Collegial leadership style
Broker	<ul style="list-style-type: none"> • Transactional leadership style • Intervention and use of power • Based on access to situated knowledge through active participation in the practice

The dimensions listed are not perfectly distinct and divergent in conceptual terms. They partly overlap, and the possibility that they are combinable must be taken into account. For example, middle managers may employ more than one dimension during one distinct meeting with teacher colleagues, in order to pursue solutions on complex problems. However, in aggregate, the dimensions portray facets of middle management practices in a professional bureaucracy context relevant and applicable to the topic subject to investigation. However, the review also underscores the need to refine this framework further, which has been a major operation in the data analysis.

The framework, although based on published research, must be regarded as tentative and suggestive.

3.5 Summary of perspectives

As elaborated in chapter two, Norwegian vocational training institutions operate in complex and fragmented environments. Moreover, school professionals, as a rule of thumb, are confronted with relatively strong technical demands imposed from the local working life environments. The internal school context is typically fragmented due to high level of differentiation through demarked knowledge boundaries between subunits. In this loosely coupled system, local adaptation emerges as a key function, which places middle management agency to the forefront. As summed up in the previous chapter, the most influential response strategy under these contingencies and constraints is suggested to be management of learning and adaptation from the micro level. This present chapter has reviewed the available literature on this research topic, drawn from various sources. All strands of research on middle management recognize the influential role played by boundary spanning middle managers.

The main body of research is drawn from the professional bureaucracy segment, where middle managers are typically professionals themselves in addition to their leadership responsibilities. They possess extensive boundary spanning opportunities, due to this complex and mixed work context. When middle managers utilize these opportunities, the research literature points to several avenues of social influence downwards as well as upwards. Determined by the research problem of the thesis, the review has concentrated on promotion of adaptive learning, and the evidence proposes strong effects from boundary spanning roles played by middle managers. The reviewed research also indicates a co-existence of boundary spanning utilization and important roles in external networks and these constituents mutually support adaptation.

The empirical evidence brought up by the review is organized in a typology of qualitative role dimensions of academic middle management. The dimensions do not show the full picture of middle management, simply because the underlying sampling is limited by the research focus. Important issues and aspects of educational middle management are therefore excluded. The five role dimensions construct a suggestive typology that in aggregate portray a space of maneuver, when adaptability is required. The emerging dimensions are, however, not clear-cut and distinguishable, and they partly overlap. The framework of five dimensions, therefore, is only a

working typology. However, they inform a starting point for analyzing empirical accounts emerging from the case study – and the framework, thus, allows images from the empirical data to be confronted with dimensions derived from theory.

Chapter 4: A practice based theory of adaptive learning

4.1 Introduction

The research problem addresses how school professionals at the micro level adapt their schooling to demands imposed from the external environments. Micro level analysis is a function of the widely reported observation that the subunit level is the key operating unit for bringing about changes in secondary school practices (Witziers, Slegers, & Imants, 1999). Moreover, the conception of the subunit as a local adaptive system is also a function of the perspective of schools as loosely coupled systems (Orton & Weick, 1990). Adaptation, thus, refers to local adjustments of didactical and instructional practices, based on collective dialogue and reflection among school professionals (Louis et al., 1996). In general terms, the rationale of adaptive learning is the organization's endeavors to improve the match between its actions and environmental demands (March, 1994a). Learning operations encompass the filtering of external feedback, collective learning and modification of action programs (March & Olsen, 1975). Search for knowledge and solutions in the external environments is also an important component of the process (Cyert & March, 1992). Moreover, the totality of these learning activities promotes an improved match between organizational actions and environmental demands.

Schoolteachers and job instructors at the workplace may have disjunctions in their understandings of the core logic of training. Mutual adjustments of understandings and action repertoires are therefore crucial endeavors in order to develop subunits as effective adaptive systems. This process is theoretically understood as integrative learning (Carlile & Rebentisch, 2003; Crossan et al., 1999). Specifically, it is suggested that that integration of knowledge across school boundaries is a crucial operation of adaptive learning within the given context. Moreover, the thesis assumes that this form of intense learning requires an integrative context (J. S. Brown & Duguid, 1991). Social closeness between actors is suggested to be an important enabling condition, simply because actors need to meet and engage in practice together, in order to construct adaptive solutions (Goldspink, 2007). The notion of the community of practice (Wenger, 1998; Wenger et al., 2002) offers a theoretical account for capturing this kind of social context. The purpose of the chapter is, therefore, *firstly*, to elaborate theoretically the nature of local adaptive learning mechanism. *Secondly*, the chapter aims to review the applicability of the community of practice construct as a possible adaptive context.

4.2 The notion of adaptive learning

The reviewed literature presents two distinct perspectives on adaptation: One approach sees adaptation as a strategic project of “long-term substitution of new ideas, paradigms, technologies, strategies, and knowledge for old ones” (March & Olsen, 1995, p.213). Another conceives adaptation as a cyclical learning process of incremental adjustments in action repertoires: Organizational actors “adapt to their environments through small steps, observing and analyzing the consequences of incremental movements and making marginal adjustments” (March & Lounamaa, 1999, p.157). The two contrasting perspectives also reflect different levels of analysis: Whereas the large-scale perspective typically uses the whole organization, or even a political institution, as unit of analysis (March & Olsen, 1989), the incremental approach is rooted in micro level analysis (March & Lounamaa, 1999; Shrivastava, 1983). The thesis builds its work on the latter perspective, where incremental learning from experience is seen as a rational strategy for discovering appropriate solutions to complex problems and demands imposed from the external contexts of the school (Busher, 2005b, 2006; Goldspink, 2007). Although the incremental and small-step nature of adaptive learning is underscored, scholars also highlight that the whole idea of adaptive learning builds on the premise that the achieved changes are “substantial enough to make a detectable difference” (March & Lounamaa, 1999, p. 175). Changes resulting from adaptive learning must be sufficiently substantial in nature, negative or positive. Therefore, changes in targets refer to technically observable effects, on which organizational actors can ground their inferences⁴⁰ (Levitt & March, 1988).

From the earliest work, theories of adaptive learning have all underscored that adaptation is more like a mutual project than deterministic compliance based on external pressures (Cyert & March, 1992; March, 1994a, 1994b). Organizations adjust their action repertoires in order to fit demands from their external contexts, at the same time as they seek to exert social influence on the same environments. It is suggested that the vocational training field exposes this mutual side of adaptation: Schools adapt to their working life environments, at the same time as the workplace stakeholders are influenced by school actors. Schools may thereby be conceived as micro constituents in their local environments (Busher, 2006). *Firstly*, school actions are largely incorporated in their local civic community (Busher & Barker, 2003). *Secondly*, schools hold membership in functional organizational fields within

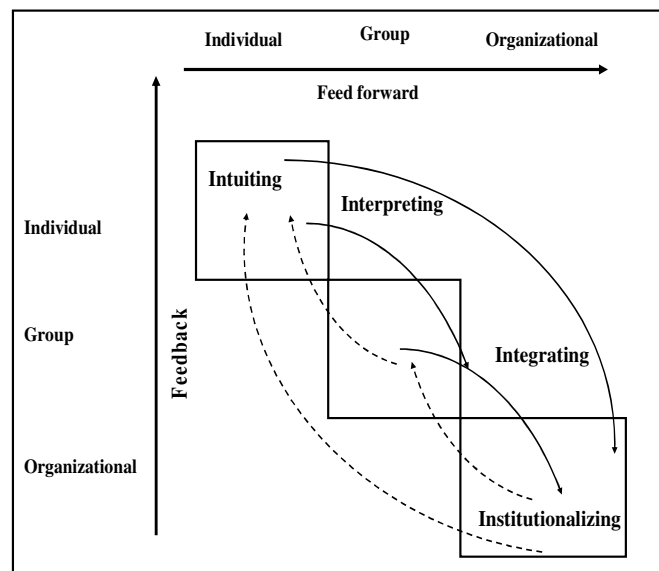
⁴⁰ The argument does not imply that all learning is intelligent (March, 1999). Rather in contrast, learning inferences may be fairly well grounded on superstitious interpretations and ambiguous events (March & Olsen, 1975). Learning from experience may even be myopic in nature (Levinthal & March, 1993).

a specific geographical area (Galaskiewicz, 1991; Scott, 2000). This may be the case within business branches and occupational fields. School actors therefore naturally seek to exert influence on these environments through micro political processes (Björk & Lindle, 2001). Micro level adaptation will therefore typically be a recursive political process, where school actors negotiate and articulate direction together with their external stakeholders. Stakeholders will thereby interchangeably function as partners and counterparts (Goldspink, 2007, p. 40). Adaptive systems, therefore, require some cultural and cognitive components, for example shared understandings across school boundaries.

4.3 Modeling adaptive learning

Based on extensive review of theories of organizational learning, Crossan and associates (1999) propose a multi-level framework of the adaptive learning mechanism. The model integrates four distinct learning processes situated at different levels of the organization, as illustrated in figure 4.1.

Figure 4.1: A multi-level framework of learning in organizations



Source: Crossan et al (1999, p.532)

The model suggests a dynamic view of learning across organizational levels, through the notion of feedback and feed-forward. Adaptive learning as such, is shaped by recursive flows of learning from individual to groups and larger collectives. Conversely, through feedback, information and knowledge are transferred from collective levels to the individual member of the organization.

4.3.1 Feed forward and feedback

Feed-forward thus denotes the transfer of learning from individuals to groups and the organization as a whole: “Through feed-forward processes, new ideas and actions flow from the individual to the group to the organization levels” (Crossan et al., 1999, p.532). Conversely, feedback is used to describe the flows from the organizational hierarchy or groups to the individual member. The framework thus exhibits two dynamic loops that span the conventional levels of the organization: Insights feeds back from the organization to groups and individuals, which may affect how people act and think. On the other hand, through feed-forward, individual insights may affect group repertoires and be converted to organizational knowledge (J. S. Brown & Duguid, 2001a; Orlikowski, 1998).

The model suggests that adaptive learning is grounded on four distinct learning processes: Intuition, interpretation, integration and institutionalization, the so-called “4I’s”. Moreover, the four learning processes bridge the levels of analysis of the individual, group and organization into a coherent cycle. The first two processes conceptualize individual learning. *Intuition* denotes individual learning through an individual stream of experience: “It is a unique individual process, and although it may occur within a context of a group or an organization, the recognition of a pattern or a possibility comes from the intuition process of the individual actor” (Crossan et al., 1999, p.525). The second ‘I’, *interpreting*, also addresses the individual member’s learning, since the process refers to a change in the individual’s understanding and actions, for example due to “knowledge and understanding about the environment” (Daft & Weick, 2001, p.251).

4.3.2 Knowledge integration

As explicated by the model, *knowledge integrating* represents a shift from individual learning to collective learning - within groups as well as within intermediate units, such as subunits and informal communities. The term

describes the process of developing shared understanding among a micro-collective of individuals, and of taking on coordinated actions through mutual adjustments of the group's micro action programs. Integration of individual insights in a group's repertoire is not entirely a simple enterprise, as there are many challenges in changing an established shared reality among individuals. The first is that individuals need to be able to communicate. Since many aspects of cognitive maps are tacit, communicating them requires a process of surfacing and articulating ideas and concepts (Cook & Brown, 1999).

Scholars have argued that when group members share knowledge, a complex transformation process is required (Bechky, 2003). The members transform⁴¹ implicitly both the nature of the novel fractions as well as the prior repertoire, through a negotiation process (Carlile, 2004). The process, as such, includes a cognitive transformation process among the group members, followed by negotiations about the implications of these new insights on their joint action repertoire (Wenger, 1998). The vehicles in the integration process encompass dialogue, negotiation and mutual adjustments among the group members. The process entails taking personally constructed cognitive maps and integrating them in a way that develops a shared understanding among the group members. It is through the continuing negotiation and conversation among members of cohesive groups that shared understandings, collective repertoires, mutual adjustment and negotiated actions take place (Crossan et al., 1999, p.528). However, knowledge integration is also conceptualized in a two-way fashion by the model: Institutionalized knowledge, organizational routines and managerial decisions are transferred to work groups through the process of integration, i.e. the feedback from a higher level of the organization. Moreover, feedback through integration may also denote transfer of knowledge to a work group from an enlarged setting, for example a subunit of the organization.

4.3.3 The institutionalization process

The fourth process, institutionalizing group-based practices into insights that are owned and utilized by a larger collective, is at the heart of the idea of organizational learning (Levitt & March, 1988). Institutionalization may take

⁴¹ The concept of transformation takes into account that the idea of retrieving locally developed knowledge for use elsewhere in the organization does not address the whole issue of knowledge integration (Bechky, 2003, p. 317). Included in the perspective is a view on the 'fusion' process as more comprehensive than solely storage and retrieval of discrete knowledge objects.

the form of between-group learning, for example at the subunit level of a Norwegian upper secondary school, and this enterprise is complex (J. S. Brown & Duguid, 2001b). It depends on several enabling conditions of the enlarged setting (Hustad, 1999) that may help and support the transfer of knowledge fractions that are embedded in a situated repertoire (Cook & Brown, 1999). Institutionalization also requires some capacity to overcome pure political barriers, in terms of lack of political will to share insights between groups (Lawrence et al., 2005).

In a team-based school organization, institutionalizing learning between teams may take the form of an alignment process, where team repertoires are mutually adjusted to each other. Institutionalization of team practices therefore requires specific enlarged contexts that enable teams to share information and knowledge, to understanding each others specific repertoires and align practices (Dibbon, 2000). In loosely coupled schools, the subunit level⁴², typically corresponding with distinct knowledge boundaries, is assumed to be the focal unit for institutionalizing new practices that might guide the work behavior in the classrooms (Witziers et al., 1999). This is especially the case within the given school context, Norwegian upper secondary education, which is seen as an archetypical case of a loosely coupled system. The subunit level is therefore assumed to be within range for the institutionalization of new practices into the technical core of schooling in the context subject to investigation.

4.4 An integrative context - the community of practice

Mary C. Crossan and associates also underscore the importance of an integrative context that allows the necessary dialogues, re-framing and experimentation that innovative learning requires. They point explicitly to the community of practice as a potential enabling context for learning among practitioners. The thesis supports this notion, but assumes the need to refine the conceptual properties, in order to fit a practical context, where members cross organizational boundaries, and thereby form a so-called distributed community (Wenger et al., 2002). In the original work, the community of practice is defined as:

⁴² As seen in chapter two, the knowledge domains of the subunit of the given context typically correspond with distinctive working life areas in the environments. For example, the school subunit of IT electronics will typically find its environment in the corresponding working life domain.

A tightly knit group of members engaged in a shared practice who knows each other and work together, typically meet face-to-face and continually negotiate, communicate and coordinate with each other directly. In a community of practice, joint sense making and problem solving enhances the formation of strong interpersonal ties and creates norms of direct reciprocity within a small community
(Lave & Wenger, 1991, p.28)

A community of practice is, *firstly*, a non-bound structural entity that may be affiliated, formally or informally, to the organization structure (J. S. Brown & Duguid, 1991). *Secondly*, this kind of grouping may be populated by individuals with formal affiliation to the focal organization, as well as by outsiders that are connected by social ties to the insiders. This property is a central component in the theoretical pre-understanding of this thesis. The term distributed community of practice (J. S. Brown & Duguid, 2001b) is used to capture the case when the community members belong to different organizations, for example schools and community stakeholders. The group members will then be unified by their joint practice, i.e. the creation of knowledge, practice repertoires and solutions to problems, although their locations may be dispersed. These groupings are typically populated by people who share a concern, a set of problems, or a vision about a topic, and who invest energy and time in order to deepen their knowledge and expertise by their joint interactions (Rock, 2005).

The members of this distributed community do not necessarily work together every day, but they meet because they find value in the interactions (J. S. Brown & Duguid, 2001a). During these interactions, members may develop a unique perspective on their topic as well as a body of common knowledge, practices and approaches. These frameworks may be of a fairly routine-based character, where they guide the work behavior of the individual, and such knowledge assets are termed 'learning curriculum' (Lave & Wenger, 1991) or a 'situated curriculum' (Gherardi, Nicolini, & Odella, 1998). What has not been explicated systematically in the research literature to date is the possibility that such a distributed community of practice may be a powerful adaptive system activated from the micro level of the organization. In that case, the outcomes of the interactions will support adaptive behavior.

4.4.1 The conceptual building blocks of a community of practice

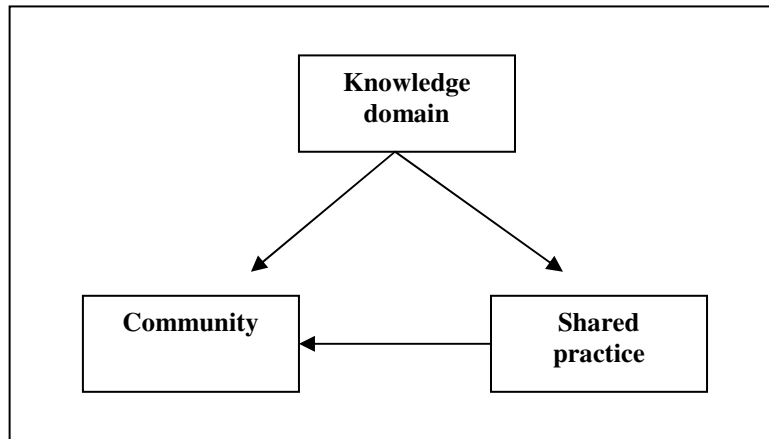
In general terms, three building blocks constitute a community of practice: The specific *knowledge domain*, on which the interactions are grounded, a shared repertoire developed by the members, termed their *practice* and a

cohesive community of practitioners. These three elements are intimately linked to each other. The most crucial, although most overlooked, point is the strong inter-dependency between the community and its practice. The value of a community is thus determined by the growth of its knowledge assets and the practice repertoire on which the collaboration among the members is grounded. As underscored by Paul Duguid, if people separate the community from its practice, the latter is reduced to a social grouping of any kind (Duguid, 2005). In a similar vein, Etienne Wenger and associates argue that it is the *unique combination* of community, practice and knowledge domain that constitutes and defines this social entity:

“A community of practice is a unique combination of three fundamental elements: a *domain* of knowledge, which defines a set of issues; a *community* of people who care about this domain; and the shared *practice* that they are developing to be effective in their domain” (Wenger et al., 2002, p.27)

Any community of practice is therefore grounded on a knowledge domain, which constructs its foundation, on which the members’ interactions will be grounded. In a community of school professionals, the subject knowledge area, or field of occupational expertise, of the professionals that hold membership, defines its knowledge domain. Besides, the domain will also comprise a body of knowledge about, didactics, methodology and pedagogy. Another constituent of the knowledge domain comes from institutional norms and belief systems within the larger educational system (Scott, 1995). Curriculum understanding, embedded assumptions about knowledge creation, learning and teaching form a distinct area, where such broader institutional scripts are typically manifested (Ogawa et al., 1999). A principal model of a community of practice and its building blocks is illustrated in figure 4. 2.

Figure 4.2: The conceptual blocks of a community of practice



Whereas the knowledge domain denotes the foundation of the community, the term practice is used to describe the knowledge assets that the members have developed through their joint activities. The practice is, therefore, a unique stock of knowledge, related to the purpose and mission shared by the members, and it encompasses both tacit and explicit dimensions (Cook & Brown, 1999; Orlikowski, 2002). The practice can be identified by a collection of frameworks, ideas, tools, information, styles, and language that community members share and that has become crucial for conducting their shared enterprise (Wenger, 1998). The practice enables the community to deal effectively with topics derived from their knowledge domain, and the practice constitutes a genuine knowledge structure that is closely related to the purpose and intentions of the members' work.

4.4.2 The domain dimension

The knowledge domain of the group does not only define the members' foundation for learning, but it also creates a sense of common identity. As pointed to by Etienne Wenger and associates: "The domain inspires members to contribute and participate, guides their learning, and gives meaning to their actions" (Wenger et al., 2002, p.28). However, identity and consciousness of the knowledge domain, to which the schoolteachers belong, do not only define membership criteria. It also helps to identify their

knowledge environments, from which members can harvest new ideas and sources of innovation. Awareness of the knowledge boundaries of the domain also enables members to decide exactly what is worth sharing, how to present their ideas, and which activities are worth investing in. The knowledge domain, as such, defines a territory for professional knowledge and collaborative practices, as well as corresponding territories of the external environments.

In vocational schools, knowledge domains of teaching are grounded on subject knowledge, pedagogical expertise and professional identity rooted in membership of the larger profession. Moreover, the domain is surrounded by societal rules of credential and certification (Rowan, 2002a). The knowledge domain also encompasses pure professional credentials, occupational certificates and a body of field-specific and practice-based knowledge and, as such, defines boundaries, in terms of rules of who can be members of a given community of practice. The explication of knowledge domain as a constituent makes the community of practice concept more applicable as unit of analysis for the study of educational organizations. This is simply because the knowledge domain is the basic premise for the structuring of education (Clark, 1983). Therefore, the theory may be applicable for capturing different levels of teacher interaction based on people's belonging to academic disciplines, fields of specialization, occupations, subject departments and so forth. In most secondary schools, knowledge domains typically overlap with relatively discernable functional subunits, where teachers of a certain field of specialization have their daily work. This property of the loosely coupled secondary school (Gray, 2004) makes communities of practice easier to identify and apply in the study of their workplace learning (Hodkinson & Hodkinson, 2004).

4.4.3 The community dimension

A community of practice is, thus, neither specific, narrowly defined, nor is it necessarily delimited to exist entirely within formal organizational units (J. S. Brown & Duguid, 1991). It is the mutual engagement that binds members together into a social entity. The argument implies that membership in a community of practice does not necessarily equate with affiliation to formal work groups or structural units. Outsiders of the organization may be central actors in a community of practice with its origin to a specific organization. The crucial point, again, is that it is the engagement in the practice that determines the membership issue. Defining the locality of a community of practice therefore must start with identifying and framing the practice on

which a community is constituted (Duguid, 2005). The latter point is neglected in many descriptions of community of practice in organizations, where many writers enthusiastically overemphasize the community and forget about its practice (Østerlund & Carlile, 2005). The neglect of this core point may perhaps explain why the notion of the community of practice has been more or less non-critically applied to a range of transient organizational units and miscellaneous work-groupings (Barton & Tusting, 2005)⁴³.

4.4.4 The practice dimension

The term practice denotes a set of socially defined ways of guiding work behavior within a knowledge domain. The practice embodies a set of common approaches and shared standards that create a basis for action, communication, performance and accountability (Wenger et al., 2002, p.28). The purpose of a shared practice is to establish a baseline of common knowledge that is owned by the members. Three properties constitute and define a community's shared practice: Mutual engagement, shared understandings and a shared repertoire. *Firstly*, practice exists because people are engaged in sense, meanings and understandings, and they negotiate with one another in dialogue. *Secondly*, it is the shared sense of purpose and direction that keeps a community together. And practice creates mutual accountability among the members, constituting a "communal regime of mutual accountability" (Wenger, 1998, p.81). The *third* characteristic is labeled *shared repertoire*. When colleagues work together, they develop communicational tools, methods, practical frameworks and tools that over time build a repertoire that is shared among them. Etienne Wenger, thus, uses the term to describe a well-assorted portfolio of "routines, words, tools, ways of doing things, stories, gestures, symbols, genres, actions or concepts that the community has produced or adopted in the course of its existence, and which has become part of its practice" (Wenger, 1998, p.83).

A crucial conceptual point is therefore the *shared nature* of the practice (Duguid, 2005). A shared repertoire may be a technical language of the practice, that allows the group to do the work with colleagues and clients, but a shared repertoire also refers to cultural components, such as taken for granted assumptions, professional norms and collective beliefs (J. W. Meyer

⁴³ As argued by Duguid, the popularity of the concept may be linked to "its appeal owes a good deal to the seductive character of community, aptly described as a 'warm, persuasive word'" (Duguid, 2005, p.109). The attractive and positively laden community term may have overshadowed the crucial importance of the practice (Østerlund & Carlile, 2005)

& Rowan, 1991). This is not to undermine that individual members have different expertise and approaches to common issues but they share a basic body of knowledge that creates a common foundation that allows members to work together effectively. A practice is, as such, a “framework for actions embedded in social negotiations” (Wenger, 1998, p. 73). The framework is also a situated knowledge asset, valuable for the members but at the same time situated in the interactions of them (Cook & Brown, 1999). Wenger’s notion of the shared practice is relatively close to the generic term *routine* (Levitt & March, 1988), at least as used in more recent work (Feldman, 2000; Feldman & Pentland, 2003; Feldman & Rafaeli, 2002). The main argument of this recent line of theorizing is that routines situate various forms of local adaptive learning, and therefore are proposed to be sources of change, - not only stability and rigidity⁴⁴.

4.4.5 Local versus distributed communities

In the original work of Lave and Wenger, the founding principles of the theory were envisioned by means of examples of learning within closely-knit groups of practitioners. These empirical accounts illustrated for example apprenticeship learning, the process by which novice members gradually moved towards social acceptance through gradually mastering the required skills. This situated learning process was labeled ‘legitimate peripheral participation’, which describes the incubation of novices towards membership in the community (J. S. Brown & Duguid, 1991). An important property of this grouping is co-location and strong ties among the members. Although the novices start their career as peripheral members, they gradually move towards the core of the group through learning and participation at close hand. The analytical point is that this community form is a local and close-knit social unit, where the members are tightly bound together through an evolving repertoire. The group’s shared practice constitutes a local situated curriculum (Gherardi et al., 1998) that guides the local work behaviors of the members. This curriculum also governs the incubation and socialization of new members.

⁴⁴ In contrast to the traditional image of routines as stable, unchangeable and inflexible response patterns, more recent theorizing has addressed their potentials for allowing knowledge creation and dynamic change (Feldman, 2000; Feldman & Pentland, 2003). (March, 1994a) uses the label ‘grammar of action’ to capture the dynamic nature of organizational routines, simply because routines must be negotiated by practitioners when they are employed in their daily work (Kieser, Beck, & Tainio, 2001)

The other archetype analyzed in the research literature refers to a large number of cases where the community itself is grounded on a distributed pattern. The most cited example is assumingly Julian Orr's field study⁴⁵ on service technicians of the Xerox Corporation. In general terms, when group members form a community that crosses organizational boundaries, and, when their practice repertoire exerts influence on disperse locations, the prefix *distributed* is used to characterize the community of practice (J. S. Brown & Duguid, 2001a; Wenger et al., 2002). Distributed communities are first of all characterized by being more inter-penetrative than bounded groups, because they recruit members across organizational boundaries (J. S. Brown & Duguid, 1991). Moreover, since the participants of the distributed community⁴⁶ carry out their daily work in different social locations, the members are more loosely knitted to each other than in the mainstream examples discussed in the original work of Lave & Wenger (1991). The members also create knowledge in one social context, i.e. their meeting places, to be applied and re-embedded into others, i.e. the workplaces of the members. In spite of this, the practice may exert substantial influence on these discrete activities.

In school organizations, distributed communities of practice may be formed when for example teacher groups and school managers engage in R&D collaboration with universities, colleges, or other knowledge institutions. Distributed communities may also be formed because the practice may be linked to larger fields of professional environments, occupational milieus or academic disciplines (Bulkley & Hicks, 2005). Two kinds of benefit may therefore come out of the engagement in a distributed community. *Firstly,*

⁴⁵ The case is discussed thoroughly by John Seeley Brown and Paul Duguid in two articles (J. S. Brown & Duguid, 1991, 2001a) . The group of service specialists created an informal community to tackle recurrent work-related problems. The main problem was that copy-machines 'behaved' deviant from what was described in manuals and handbooks. They therefore met mostly on a daily basis to solve problems related to their work at customer locations, - through dialogue, discussion and 'brainstorming'. The Xerox service technicians, all located within a geographical area, thereby formed a distributed community of practice. Through this pattern of regular interactions, the workers developed a unique body of knowledge, a practice repertoire that guided and helped them in their daily work.

⁴⁶ The upfront case of the local communities of practice are most frequently described in terms of the so-called 'virtual' communities, where the members perhaps do not even meet face to face (Wenger et al., 2002). They rather communicate through electronic web-based networks. Their interactions are shaped in a distributed pattern, which has given rise to, although the virtual form is the extreme case, the distributed community category. However, the 'virtual' form is only one of several categories of the distributed community of practice type.

the engagement may provide political, financial human resources recruited from the outside of schooling. *Secondly*, cross-boundary interactions embedded in a distributed community will also provide opportunities for intense learning to occur, and “allow the organization to develop collective, coherent, synergistic knowledge out of potentially separate, independent contributions” (J. S. Brown & Duguid, 1998, p.97). From this perspective, distributed communities of practice may be potential contexts for problem based learning and adaptation when they include external stakeholders.

4.4.6 The relational dimension of a distributed community

Because a distributed community is grounded on interaction between actors that have their work in disperse social locations, the relationship between them is a crucial component of this genuine learning structure (Wenger et al., 2002). Social network theory conceptualizes the relationship between members as network ties (Newell et al., 2004). A social network is generally defined as a set of nodes, and it is the ties that represent the relationship, or lack of relationship, between the nodes (Brass, Calaskiewicz, Greve, & Tsai, 2004, p.795). By nodes is understood the actors of the network, which can be individuals, work units or organizations.

The content of the social relationship between network members is most frequently theorized through the conceptual pair of weak versus strong ties (Granovetter, 1973; Hansen, 1999). The strength of a social tie is defined as the function of the “amount of time, the emotional intensity, the intimacy (mutual confidence), and the reciprocal services that characterize the tie” (Granovetter, 1973)⁴⁷. Strong ties are thus characterized by *frequent interaction* and *close distance*, whereas the converse pattern counts for weak ties. The strength of social ties is furthermore not a static property: Over time, weak ties might grow strong, and vice versa (Thune, 2006, p.69). Social network research suggests that *both* strong and weak social ties play a significant role in organizational learning, however, at different stages of the learning cycle. Weak ties are effective vehicles in the search for new knowledge and opportunities, whereas strong ties are effective lubricants for the transfer of knowledge across organizational boundaries (Hansen, 1999; Lund Vinding, 2002; Szulanski, 1996).

⁴⁷ Cited in Thune (2006, p.69)

Using social network theory to capture relational sides of adaptive learning makes intuitive sense⁴⁸. It has for example been shown that both weak and strong ties between school professionals and actors in their local environments might serve as strategic instrument for adaptation (Bakkenes, de Brabander, & Imants, 1999). Informal connections between schoolteachers in the technical core and external stakeholders may promote adaptability, where the actors engage in “informal coordination that although often formally inappropriate, keeps the technical activities running smoothly” (J. W. Meyer & Rowan, 1991, p. 59). It may be an effective way “to get the participants to make their best efforts in situations made problematic by institutionalized myths at odd with immediate technical demands” (ibid, p. 59). In that sense, technical issues of instruction and training may be dealt with and negotiated recursively across school boundaries through a fashion of osmosis lubricated by social network ties. School actors, in order to absorb knowledge across school boundaries, and thereby foster local adaptation to civic community norms, also use social networks as instruments. This type of professional network may also be found in university-school relationships, in R&D projects, and developmental projects related to classroom activities.

The thesis argues that social network theory adds complementary value the distributed community of practice. Although the two streams of theorizing are overlapping in some areas, they also represent distinctive perspectives. As argued by Paul Duguid (2005): “Whereas social network theories illuminate “unseen links”, community of practice theory points to “unseen boundaries.” Moreover, “these specific boundaries are shaped by practice” (Duguid, 2005, p.115), and they therefore demark insiders from outsiders, even within a relatively strong social network. However, despite these differences the two perspectives seem to conjunct when it comes to collaborative learning among dispersed actors: Whereas community of practice theory explicates the human capital asset, i.e. the practice, the social network perspective highlights the relational side of the knowledge, i.e. the social capital⁴⁹ (Nahapiet & Ghoshal, 1998). A more pragmatic approach, as

⁴⁸ Teachers typically engage in a range of professional relationships with external actors. Teacher trade unions form professional networks that exert substantial influence on decision making processes among regional policy makers (Song & Miskel, 2005).

⁴⁹ Borgatti and Foster (2003) claim that the bulk of organizational learning research to date has mostly focused on declarative (know-what) or procedural (know-how) types of knowledge, with little inquiry into organizational learning as a function of relationships, i.e. the “know-who” knowledge components. The implicit argument is to put more emphasis on the function of social relationships in organizational learning.

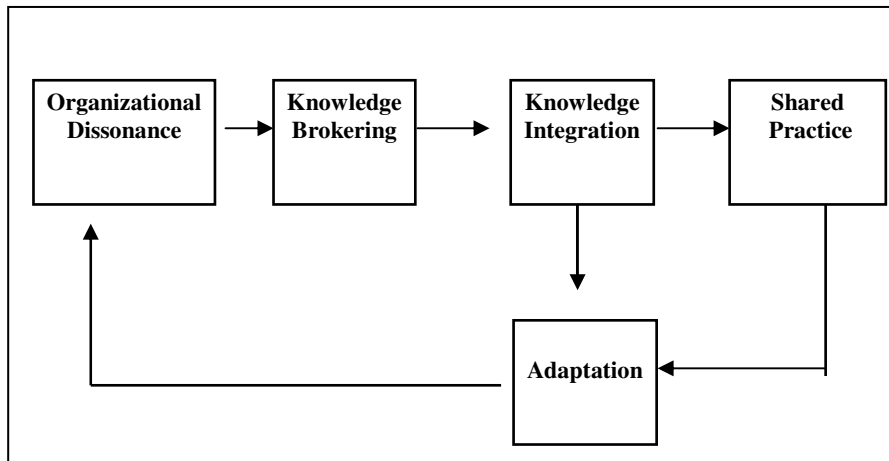
proposed by the thesis, suggests the two perspectives to be combinable and provide synergy in some areas. Furthermore, it may be beneficial to combine them, in order to capture the full strength of a distributed community, simply because they highlight different sides of the same phenomenon. The thesis therefore recommends incorporating the effects of social ties, conceived as a relational dimension embedded in the distributed learning structure.

4.5 Modeling the adaptive learning process

The review of adaptive learning theories underscores the cyclical nature of this phenomenon. Moreover, the theoretical sources reviewed assume that adaptive learning is activated and triggered by some kind of problem perception. In bounded rationality theories, this point is captured by the general idea that discrepancies between targets and outcomes activate search in the environments (March, 1994a). The term organizational dissonance describes a close to similar set of activation triggers, and this concept is incorporated into the analytical framework. The adaptive action program is furthermore activated from the local level of the school organization.

Moreover, the micro level analysis implies that learning within groups, in social networks and informal communities of practice are seen as adaptive drivers. However, since learning is dispersed, various forms of connectivity and brokering are required. This notion is captured by the middle management contribution, through various forms of boundary spanning roles, as discussed in chapter three. In the learning process, this function is captured by the notion of *knowledge brokering* (Glover et al., 1998; Wenger, 1998). The thesis suggests knowledge brokering to be a crucial function, which is undertaken by academic middle managers. The outcome of adaptation is a *shared practice* that governs behavior in dispersed social locations, which means both schooling and workplace training. The learning process, in line with the framework presented previously, is conceptualized as *knowledge integration*. The model of the adaptive learning process, distilled from the theory discussion in chapters two, three and four, is illustrated in figure 4.3.

Figure 4.3: Modeling adaptive learning in a distributed community of practice



In general terms, organizational dissonance denotes recurrent gaps between the existing routines, structures and technologies and environmental demands, as perceived by a dominant coalition of the organization (Kvålshaugen & Amdam, 2000). When organizational dissonance is perceived among a strong coalition within the organization, search for solutions, better understandings, tools and frameworks may be stimulated (Cyert & March, 1992; March, 1994a). A sufficient powerful coalition may be found at the local level, for example populated by schoolteachers and their middle manager within a distinct occupational domain. When this coalition perceives recurrent mismatches in their core technology, where the existing rules and structure do not provide appropriate solutions, this can fairly well be understood as dissonance. The further proposition of the thesis is, thus, that dissonance will activate adaptive learning.

The process referred to as knowledge integration might encompass two different learning operations, integration of knowledge within groups and between them (J. S. Brown & Duguid, 2001b). The *first* enterprise is about sharing ideas, insights and experiences within a closely-knit group. Commonality in their practice repertoire facilitates the transformation of insights into shared understandings among the group members involved. The basic vehicle is negotiation about how experiences, concepts, proposals and problems shall be understood, and how these inferences are to be implanted into the group's frame of reference (Rock, 2005). Nevertheless, the process

is not solely a cognitive enterprise, because it also refers to gaining political acceptance and compromises among conflicting viewpoints and interests. Integrating knowledge between groups, *secondly*, is a far more complex enterprise, simply because of the boundaries of practice that distinguish them from each other. Both forms of integrating knowledge into collective repertoires call for different agency contributions, as elaborated in chapter three. Although different concepts are in use to describe the agent's role, several scholars argue that active engagement from an external facilitator is a key factor in such complex learning processes (Sadler, 2001). As pointed out by Lawrence et al (2005), integrating and institutionalizing new ideas and practices are not only a social-psychological processes contingent of the cognitive schemas and frames of reference available for the members.

Rather, knowledge integration within groups is also a process dependent of a minimum of political will: "We argue that the process of integrating also involves episodes of power on the part of the interested actors" (Lawrence et al., 2005, p. 182). The integration of individual insights towards a shared repertoire accepted, owned and internalized by the whole group thus requires functions of managing conflict and negotiation among different worldviews and interests. Negotiated meaning is achieved gradually as it emerges from a process of give and take, continuous interaction and compromises. And as noted by Wenger, "the experience of meaning is not produced out of thin air" (Wenger, 1998, p.52). Therefore the broker's agency contribution is crucial, as argued in chapter three.

4.6 Summary of perspectives

As elaborated in chapter two, Norwegian upper secondary schools are loosely coupled organizational systems, where, based on the reviewed literature, *local adaptation* is suggested to be an appropriate and effective response strategy. Moreover, as argued in chapters two and three, local adaptation works as a rational instrument in concert with *enhanced leadership* (Orton & Weick, 1990). These two mechanisms in the reviewed literature are suggested to offer a conjoint contribution in the loosely coupled school organization. As pointed to by the theoretical sources of this chapter, adaptive learning in the given context is understood as a *mutual project* among players within the same organizational field. That is, both local school professionals and working life stakeholders operate in local fields demarked by occupational boundaries. Although chapter three highlights well the agency contribution by middle managers as a key component of the

adaptation enterprise, boundary spanning is not sufficient, although required. Besides, a genuine social context for mutual adjustments and sharing of knowledge is proposed to be a crucial condition for adaptive learning. The notion of the *distributed community of practice* captures this reality fairly well. This social entity captures knowledge creation among actors that work in disperse contexts, and the theory explicates the outcome of the learning endeavors, i.e. the practice. Whereas social network theory highlights the relationship among the actors, the community of practice perspective captures the local and informal knowledge creation.

Vocational training actors operate in local environments where *technical demands* are imposed on their core technology in a cyclical and iterative pattern. At the same time, the loosely coupled system does not resolve such challenges through routines and structures. *Organizational dissonance* is therefore proposed to occur and reoccur. Dissonance is thus seen as an activation trigger of the learning cycle. Since mutual adjustments of understandings and action programs are central components of the adaptation process, the review in this chapter pinpoints that adaptive learning is primarily about *integration of knowledge*. Moreover, as elaborated in chapter three, integration of knowledge across formal and informal boundaries is supported and facilitated by various boundary-spanning roles performed by middle managers. Moreover, the *micro level* perspective brings middle management agency to the forefront of the adaptation process. Through the aggregate utilization of supplementary boundary spanning roles, academic middle managers, as concluded in chapter three, provide a significant contribution to the adaptation process.

Chapter 5: Methodological framework

5.1 Introduction

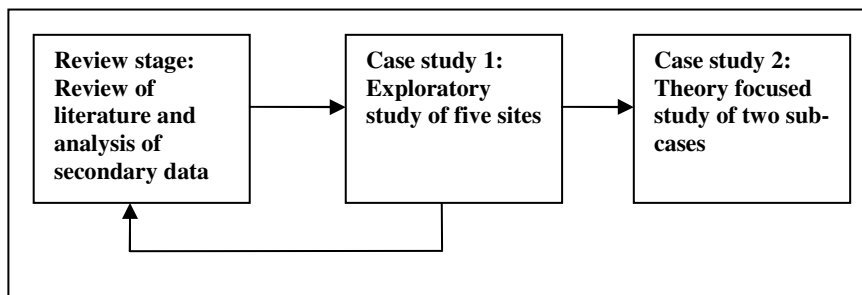
This chapter aims at making explicit the methodological assumptions and principles that have guided the research process. Specifically, three bedrock considerations have guided the methodological choices during the study. The *first* refers to the conception of social science research as a dialogical process based on continuous interplays of deductive and inductive inquiry (Ragin, 1994a). The core of this principle is the structuring of the research process in a design that allows a continuous *dialogue* between theory and evidence. This means in practice that theoretical ideas and baseline assumptions are continuously contested with analytical properties emerging from the data analysis. *Secondly* and nested, the conception of social science research as a dialogue is embodied in an *explorative-integrative* strategy (Maaløe, 2002). This strategic principle seeks, at least to some extent, to combine benefits from exploratory inquiry with a theory-focused framework - the integrative aspect (Klein & Myers, 1999). Theoretical templates derived from the literature review are continuously contested with the emerging analytic frames that arise from exploratory inquiry – and vice versa. The *third* principal choice refers to a *case study* approach (Andersen, 1997; Yin, 1994). This part of the study uses multiple data collection methods in concert, although the main instrumentation is qualitative inquiry (Denzin & Lincoln, 1994; Miles & Huberman, 1994b).

Both review of theoretical sources and analysis of empirical categories is processed in concert during the respective sequences of design, data collection and data analysis. The ongoing dialogue has thus, refined both the theoretical basis and the analytic frames of the research, based on selection and data reduction (Miles & Huberman, 1994a). When the study has reached the saturation point, the gap between theory and evidence has been significantly narrowed, which means that theoretical models have been revised and adjusted. It is this saturation point (Strauss & Corbin, 1998) that enables the researcher to raise discussions and implications relevant for theory development and for the substantive field. The subsequent sections will lay out how these principles are employed in practice.

5.2 Overall structure of the research process

Following the guiding principles and considerations briefly described above, the study is organized into three stages: Review work in concert with analysis of statistical data followed by a case study designed in two phases. The structure reflects how the dialogical conception is implemented in practical research operations. The first two phases embody a continuous analytical dialogue between evidence drawn from exploratory case inquiry, register data analysis and review of literature. Through back and forth procedures, the conceptual framework was refined as the analytical frames from the case observations were sharpened. The final phase of the case study is strictly theory-focused and integrative (Klein & Myers, 1999). The combinative approach is also reflected in the employment of different methods in concert. Various data sources were collected during the development of the study, and even in the final phase of the case study, qualitative methods were paired with secondary data. Figure 5.1 shows an overview of the research process.

Figure 5.1: Overview of the research process



As indicated by the model, this work has been iterative in nature, especially in the first two phases: Empirical observations guided new review operations, which again refined the methodological framework. Within each of the stages, theoretical propositions, conceptual categories and images from interviews were contested with the evidence drawn from a wide range of secondary data. For example, all in the initial phase of the study,

theoretical baseline assumptions were contested with key evidence from secondary data analysis, mainly drawn from official databases⁵⁰.

The outcomes from each of the stages are thus twofold: *Refinement* of theoretical assumptions along with *choices* about how to continue the research process. For example, early inferences of the first phase led to the decision of shifting the unit of analysis to the micro-level of the school, i.e. the subunit. The choice was governed by the emerging image of the research context as loosely coupled organizational systems. On this ground, an exploratory oriented case study was conducted. The sample consisted of five cases selected through the application of a maximum variation principle (Denk, 2002), at the purpose of mirroring the breadth of the empirical field subject to investigation. Contextual variables and contingencies that were sought to be given variation through the selection were: *Structure* of the student program, *core technology* embedded in the curriculum, *knowledge domain* and *environmental relationships*.

Analysis of the initial case observations, paired with analysis of large-scale longitudinal register data, displayed substantial differences between the vocational and academic domains. Substantial differences were exhibited when it came to core technology, curriculum structure, internal complexity embedded in the work context and external dependencies to contingencies of the external environment. This inference informed the choice to narrow the inquiry towards a single case study based on two similar sub-cases⁵¹. The theoretical and contextual scope was narrowed through radical data reduction (Miles & Huberman, 1994a). In this respect, the analytical inferences from this first-order analysis finally determined and locked in the design of the study.

More importantly, the two sub-cases were also selected for further investigation because they exposed significant theoretical properties. *First*, the two sites exposed a stable and institutionalized pattern of adaptability, through the school professionals' balancing act of inclusiveness with sensitiveness to workplace demands. Since the pattern of adaptability was

⁵⁰ Secondary data was drawn from Statistic Norway (SSB), www.ssb.no and the central intake database of upper secondary education, labeled VIGO, made publicly official through the website of the Norwegian Education Directorate, www.udir.no. See chapter six for analysis of the empirical field, based on large scale, mostly longitudinal, secondary data.

⁵¹ As I assessed the situation, it would therefore be 'fuzzy' to continue with the whole range of sites represented in the sample. The analysis thus gave rise to a choice of continuing the investigation of the first and the third sites. See list of sites in table 5.1.

identified, the underlying adaptation mechanism and structure could thereby be investigated further in detail. A series of methodological challenges could also thereby be resolved solely by case selection. *Secondly*, the initial analysis also exposed a distinct and local learning structure, extended middle management roles and institutionalized interactions with stakeholders – all embedded in the two sub-cases. The shift between the first and second phase of the case inquiry, thus, contributed significantly to an increase in the theoretical focus of the study. An overview of the research sites and data sources is presented in table 5.1 below.

Table 5.1: Sites and data sources of the case inquiry

Site No	Site description	Empirical observations
1	Vocational school Technical- industrial orientation	15 single interviews 2 group interviews Teacher survey Secondary data
2	Full combined school Most subject domains represented	9 single interviews Secondary sources
3	Vocational school Healthcare, social services and food processing trades	7 single interviews 2 group interviews Secondary sources
4	Academic school Pure academic orientation, all specialization directions represented	8 single interviews Secondary sources
5	Academic school with sports Academic school with sport	8 single interviews Secondary sources

The first and third sites, anonymously labeled ‘*Alpha*’ and ‘*Beta*’ constitute the two sub-cases⁵² of the main case inquiry, whereas the other three sites are mainly used in the initial phase. The second order analysis of the ‘*Alpha*’ and ‘*Beta*’ sites enabled the researcher to investigate adaptive pattern that had been institutionalized over time: Learning structure, adaptive learning process and leadership roles.

⁵² Descriptive data from the ‘*Alpha*’ and ‘*Beta*’ sites are laid out in chapters seven and eight of the thesis

5.3 Research as a dialogue between theory and data

As stated, the leading methodological assumption of the study is the conception of the research process as a ‘dialogue between ideas and evidence’. According to Charles C. Ragin (1994a), the nature of this dialogue process strongly influences the way principles of social science research are employed in practice:

Social research, in simplest terms, involves a dialogue between ideas and evidence. Ideas help social researchers make sense of evidence, and researchers use evidence to extend, revise and test ideas. The end result of this dialogue is a representation of social life – evidence that has been shaped by ideas, presented along with the thinking that guided the construction of the representation. (Ragin, 1994a, p.55).

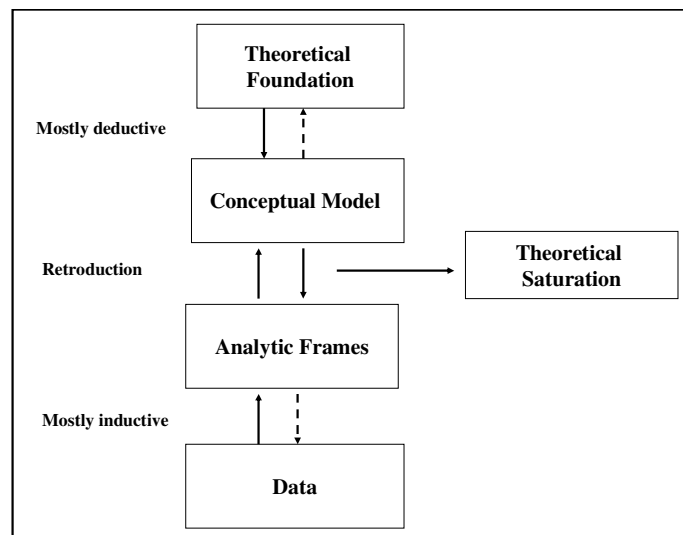
The dialogical approach implies a perspective on social science research that is neither merely deductive nor inductive. Rather, it is rather based on a series of back-and-forth procedures between theory and analytical images grounded on the ongoing empirical observations. The dialogue-based approach does not deny that hypothetic-deductive methodology is a bedrock foundation of all social research, even when hermeneutic methodology is in use (Elster, 1983). According to Ragin (1994a), dialogue is rather about making explicit the interdependence of inductive and deductive operations through a tight coupling between theory and evidence during the evolving study.

The dialogue-based principle recognizes, on one hand, the potential value of inductive theory building (Glaser & Strauss, 1967; Strauss & Corbin, 1998). Gradually, the researcher makes empirical observations, from which he/she can construct theoretical images, in order to create more complete portraits of how theoretical propositions work in practice. Grounded on images drawn from raw data, analytic frames can be constructed. Theoretical ideas are then elaborated through analytical frames, and “frames constitute ways of seeing the things they elaborate” (Ragin, 1994a, p.58). From pure empirical observations, an analytic framework thereby gradually emerges. As stated: “Emergence is the founding principle of inductive theory building” (Strauss & Corbin, 1998, p. 34), and during the process, the initial categories and concepts are sought to be refined into a coherent analytical framework. The building blocks of such a framework are conceptual categories, dimensions that count for variation, and relationships between these entities.

On the other hand, substantive theory is seldom grounded on empirical categories without connections to a baseline theoretical foundation (Miles &

Huberman, 1994b). The dialogue based case strategy is therefore also theory-focused. The theory-evidence dialogue typically starts with relatively broad properties in focus. During the evolving dialogue between theory and data, conceptual entities become clearer, and the research focus will typically become sharpened and more specified. This is in particular the situation when complex processes are in question for the researcher, where no coherent a priori propositions exist for testing or trial in practice. A principal model of the dialogue principle is illustrated in figure 5.2.

Figure 5.2: Research as a dialogue process (adapted from Ragin (1994a))



Source: Ragin (1994a, p. 57)

The back and forth process then typically moves from broad descriptions towards focusing rather limiting relationships. As such, both inferences from data, key concepts and the research question will be refined and sharpened during the interplay. The dialogical framework aims thereby to narrow the gap between the original theoretical ideas and the emerging inferences drawn from empirical observations. The *decisive loop* of the dialogue process model is, however, the interaction between the evolving conceptual model and the analytical frames that come out of the data analysis. This process is labeled ‘*retroduction*’ by Ragin (1994a). ‘*Retroduction*’ is the critical coupling mechanism, which leads to both a refined conceptual framework and guidelines for further data collection and

analytical procedures. By contesting the substantive theory developed from data, the accuracy of explanation may be increased. After several loops of ‘retroduction’, the empirical investigation may be theoretically saturated. At this final stage the analytic frames from the data and the conceptual model are integrated as closely as possible (Glaser & Strauss, 1967). In other words, the research dialogue aims at reducing the gap between theory and data, and the point of theoretical saturation represents the minimum size of this gap (Thune, 2006, p. 91).

5.4 The research strategy

5.4.1 The two guiding principles

The dialogical conception requires a research strategy that allows for certain degrees of *flexibility* and *sensitivity*. By flexibility is thought the need for the researcher to maneuver in accordance with what comes out of the idea-evidence dialogue, including the need to alter the conceptual framework and procedures for data collection. As indicated by the model in figure 5.1, this is an important bedrock consideration inherent in the strategy of this research project. Since the purpose of the study was to provide research-based knowledge about middle level leadership of adaptation in an area where no coherent conceptual framework existed⁵³, flexibility has been a crucial strategic consideration.

The research process is thus non-linear and iterative in nature; and in consequence, the conceptual framework, unit of analysis and the conception of what the ‘case’ is a case of (Ragin, 1992), gradually evolve. When this is the situation, a flexible research strategy is in favor, and a case study is widely recognized as appropriate to meet such demands (Eisenhardt, 1989, 1991). Most commonly, the term case study is used to characterize different research strategies that intensively investigate a small number of observational units, the so-called ‘small N’ strategy. However, the case study genre ranges from in-depth studies of a single unit to comparative studies of

⁵³ The argument is twofold: The research literature did not offer a coherent conceptual framework with an acceptable fit to the research problem. Moreover, there is little published research of school leadership and management from the Norwegian context.

a larger sample of cases, where relatively complex patterns are possible to detect⁵⁴.

Secondly, sensitivity inherent in the design and the analytical framework is required, in order to capture the significant properties that emerge from the body of evidence analyzed. The phenomenon subject to investigation, i.e. management of adaptive learning, is a complex and fluid social enterprise that crosses boundaries and organizational levels, which bring sensitivity in favor. The consideration of sensitivity strongly influenced the choice of qualitative data collection and analysis. The researcher sought to uncover as much as possible about the events, experiences and interdependence during the observations. *Discovery* as such, is a central element of a qualitative research strategy (Strauss & Corbin, 1998), because unexpected categories, relationships and processes are ‘the heart and soul’ of qualitative inquiry (Creswell, 1998). Equal important, in studies where it is assumed that ‘context matters’ (Ragin, 1987), openness to discovery is important. The point is that it must be expected that contextual conditions and surprising events may influence on the case subject to investigation. Therefore, the exploratory aspect is important and deliberately chosen as a strategic component. The researcher wanted to be able to discover undiscovered properties during the evolving research process, and to be able to integrate these properties into an analytical framework. Qualitative research is therefore, by design, to some extent open-ended in nature. The most central elements employed in the study are, thus, *openness to discovery* and *analytical induction* (Ragin, 1994a) as guiding analytical principle.

5.4.2 Constructing the case and determining the unit of analysis

However, as underscored by case methodology scholars⁵⁵, care is recommended in relying on conventional social categories as cases. Cases are conceived as theoretical constructions selected from a theoretical universe instead of from a statistical (Andersen, 1997). Defining something as a case is a strict analytical operation as it brings closure to the relationship between theory and data (Ragin, 1992). Specifying the case, or more precisely ‘constructing the case’, is thus one of the more important analytical task. The answer to the fundamental question of what the case is *a case of*, in

⁵⁴ See Ragin (1987; 1994b) for demonstration of methodology based on fuzzy sets and binary algebra. These instruments are employed in order-to-order case variables quantitatively. However, the samples in his models contain between 15-25 cases, and represent a middle-range area of case methodology.

⁵⁵ See Andersen (1997) and Yin (1994)

theoretical terms, and the answer tighten the couplings between data and theory. Case definition is therefore tightly coupled to choice of conceptual framework and the hypothesized relationships that are under investigation. During the research dialogue, the case definition will typically develop from a conventional unit towards a pure theoretical entity (Yin, 1994, p.23).

During the second stage of the study, the conception of the 'case' was more or less the 'subunit' of the selected research sites. During the research process, the conception of the 'case' shifted from the customary category of the subunit towards an identified multi-lateral learning system, of which the middle manager was found to be a key component. The case that finally arose from the theory-data dialogue was the emerging 'distributed community of practice' - and this analytical and theoretical construction emerged consistently across both sub-cases. By this operation, that actually continued over a long time-span, the analytical focus shifted from a conventional unit, a functional subject department, to a theoretical entity, the distributed community of practice. This fundamental part of the theory-evidence dialogue resulted in a 'case' that connects analytical frames directly to theory. Moreover, this operation links the unit of analysis more explicitly to the purpose of the study. It was then possible to be more specific about the middle management roles, conceptualized as 'knowledge brokering', since this is an integrated part of the underlying theory of the case. The research then proposed relationships concerning the way various middle management dimensions related to the case.

The more general point is that determining the unit of analysis, and 'the case' is not a pre-fixed operation, but evolves during the research dialogue. Ragin (1987) suggests that it may be useful to distinguish between two meanings of unit of analysis: Unit of observation and unit of explanation: "Observational units refer to the unit used in data collection and data analysis; explanatory unit refers to the unit that is used to account for the pattern of results obtained" (Ragin, 1987, p. 8). In this present study, observational units are individual actors and groups, while the explanatory unit of analysis goes beyond individuals and customary groups, by using a pure theoretical construction.

5.5 The research design

5.5.1 The main ingredients of the design

A research design represents the structure of the research process, in such a way that it forms a logic that links conclusions to the initial research questions of a study. A key criterion is tight coupling between the elements of the study. Miles and Huberman (1994a) propose five main ingredients of a qualitative based case study: The conceptual framework, research questions, case-definition (and thereby the units of analysis), sampling criteria and tools for instrumentation. A brief description of these main ingredients is given in table 5.2.

Table 5.2: The main ingredients of a research design

DESIGN COMPONENT	DESCRIPTION
Conceptual framework	A conceptual framework lays out the key constructs, variables, and the relationships of the study. The components are adjusted, refined, sharpened and contested during the research dialogue
Research questions	Research questions clarify priorities and foci of attention, and they usually represent a more detailed operationalization of the conceptual framework
Case definitions	Theoretical properties and boundaries of a 'case' are at the heart of the choice of what the 'case' is
Sampling	Sampling criteria and choices reflect a back and forth process during the successive waves of data collection.
Instrumentation	Instrumentation refers to procedures of data management in order to enhance validity, credibility and generalization beyond the substantive research context

Source: Miles & Huberman (1994a, pp. 440-441)

Creating and constructing the conceptual framework is the major step in a research project, because this series of tasks constitute the frame conditions of the study. Research questions are derivatives of the conceptual framework,

and being a function of it, research questions will also be improved, sharpened and refined during the continuous adjustments and refinements of the conceptual model. Again, the conceptual framework and its derived research questions determine the delimitation and definition of what is the 'case'. Qualitative researchers must characteristically think purposively and conceptually about sampling which involves both theoretical sampling and being sensitive about contextual properties of the cases. The point is to capture the whole configuration of aspects that constitute the 'case' (Ragin, 1987), the whole understanding of the contingencies and conditions, under which a particular finding operates.

As described, the present design evolved during the dialogical process of the study. The termination of the first case study, which opened up for a single theory-focused study, represented a 'qualitative break' in the development of the design. Not only was the empirical scope reduced, but a more holistic conceptual framework was also pursued. This shift was, however, not only a function of theoretical findings that emerged. It was equally determined by sensitiveness to the context investigated, for example fundamental differences in core logics between vocational training and academic schooling. The larger point is that the shift between the first and second stage of the case study not only changed the sampling and the case definition. It also opened up for a significant advancement of the conceptual framework and its underlying theoretical understanding.

5.5.2 Selection of research settings

A form of purposive sampling was used to select participants for the first stage of the case study. The sampling process was neither purely theory driven nor was it solely exploratory in nature. Criteria in the initial part of the study were derived from a theoretical framework and contextual contingencies that were relatively broad in scope. Upper secondary education was chosen as field-context at an initial stage of the study. Influential considerations were especially rooted in the perception of this school type as characterized by large scale, large internal complexity, and strong dependency on external environments. More pragmatic, management routines, structural design and leadership roles are relatively standardized and institutionalized throughout the educational sector⁵⁶. Selection of research sites therefore may be seen as a trade-off between opportunity of access and convenience compared with whether or not this opportunity provides sufficient insight to the theoretical phenomena of interest. With

⁵⁶ Described in working papers (Dimmen, 2000; Paulsen, 1999a, 1999b, 1999c)

these considerations on the baseline, five sites were selected for the initial case study, all drawn from one of the counties in the Easter part of Norway.

However, as the study progressed, some degree of theoretical sampling was employed, in order to pursue representative conceptual properties included in the units selected. In the first phase of the case study, the five sites were sampled through adopting maximum of variation method (Miles & Huberman, 1994b, p.28). The selection was made in a manner that ensured the sample mirrored a broad scope of structural and contextual contingencies: Subject domain, teacher cultures, curricula, external environments, institutional norms and core technology. In that sense, the criteria upon which the maximum variation sampling was based, reflects broad contextual themes found in Norwegian upper secondary education. Selection was, on one hand, bounded to the field of investigation, but on the other, it also reflected themes that had emerged from the literature review.

5.6 Data collection

The main data collection instruments of the case study were semi-structured interviews paired with document analysis. This pairing was a deliberate part of the instrumentation, in order to crosscheck, control and gain specification of themes emerging during the interviews - and vice versa. Moreover, data was gathered in an iterative fashion, because in qualitative research, data gathering and data analysis are tightly interwoven processes (Miles & Huberman, 1994a). Grounded on the initial interpretation of the interviews, the framework for the next interviews was adjusted, along with continuous refinements of the conceptual framework. In this manner, the dialogical principle also guided the data collection. Theoretical sampling was employed in the recruitment of informants, which means that actors with the potential of shedding light over the research issues in focus were prioritized. Additionally, review of secondary sources contextualized case findings into a broader field of education.

5.6.1 Qualitative interviews

The semi-structured in-depth interview was chosen as the most suitable data-gathering tool across the research sites. A semi-structured approach employs loosely defined questions for guidance during the conduct of the interview. I decided to adopt this form because it allows a dialogue between the interviewer and the interviewee. The conversational dialogue is crucial for

the researcher, because it allows the researcher to ask follow up questions in order to clarify the content of the interview passage. The flexibility embedded in this interview format also enables the researcher to pinpoint issues and to use the dialogue to quality assure that the meaning of the interviewee is understood in a valid way. In order to elicit this depth of response from each interviewee, the interview session was sufficiently long to capture the content, usually between one to two hours.

Interviews were taped with the use of discrete recording equipment and the informants were offered the choice of accepting the taping procedure, and all accepted it. The interviews were transcribed verbatim, shortly after the session in order to build up the text database of the study. The documents were organized in terms of file name and retrieval codes in the database to simplify the coding process. Prior to coding and analysis, a copy of the interview transcript was sent to the interviewee, in order to control the content alongside the opportunity to make comments and remarks. This operation was a deliberately chosen, and explicitly communicated, component of the instrumentation, in order to ensure an accurate and a reliable representation of the meaning exposed during the interview session. This message was also explicitly underscored in the official letter that introduced the informant to the research project. About 20 % of the interviewees gave supplementary comments to the transcription. Some of these comments were of a linguistic nature and others concerned clarification of the meaning of the participant. One interviewee wanted a follow-up interview to clarify a limited sample of topics, which was accepted and carried out the following day.

5.6.2 Follow up interviews

Follow up interviews were conducted in order to increase the reliability and validity of particularly strategic interviews that gave rise to rich and detailed descriptions of categories, interpretations of events and processes. The purpose of the interview was to assure the quality of the content in the first round, and to expand the richness and deepen the understanding of the phenomena. Four follow up interviews were conducted during the process. These interviews were transcribed and structured in accordance with the same procedures as in the first round. In order to crosscheck and control critical interpretations, inspection of a series of secondary documents also accompanied these interviews.

5.6.3 Group interviews

Group interviews were conducted with teacher teams. Issues taken up in individual actor interviews were actively prompted to assure that initial interpretations were confirmable in a larger context. Group interviews are recommended as a proper qualitative data gathering method, because it allows group members to describe the rich amount of details: Experiences and the reasoning behind their actions, beliefs, perceptions and attitudes. A small group of well-informed individuals may be more informative and valuable than many representative samples. The negative aspects arise from psychological factors that may limit the quality of the data. Censoring and conforming influence exerted by strong members of the focus group are of the most frequently mentioned pitfalls of focus group interviewing.

The purpose of these group interviews was to provide another means of data collection and to support the triangulation of the data strategy. The actual groups sampled were teacher teams and management teams interviewed in their natural work context. The group sessions were drawn from the two sub-case sites of the main study, in order to provide additional information and to ensure the internal validity and credibility of the interpretations. Both types of group interview enlarged the richness and specificity of the body of evidence, and several themes and issues were specified in detail in their natural context. Beside, the triangulation side of the method was judged as relevant for the strengthening of the internal validity.

5.6.4 Secondary data

The study makes use of a series of secondary sources collected at different levels of analysis. The purpose of the data collection has been triangulation considerations, along with the purpose of integrating validity issues into the design. An overview of secondary data used in the analysis is presented in table 5. 3.

Table 5.3: Secondary data sources collected at different levels

Stage of research process	Secondary data sources
The review stage	<ul style="list-style-type: none"> • Review of a recently reported longitudinal research of student cohorts⁵⁷
	<ul style="list-style-type: none"> • Analysis of register data from official statistical sources⁵⁸
Case study 1: Exploratory case inquiry	<ul style="list-style-type: none"> • Inspection of official policy documents describing both the regional county (meso level) and all research sites (organizational level) • Inspection of internal school documents: Reports, minutes of meetings, routine specifications and external evaluation of student behavior
Case study 2: Theory-focused study of two sub-cases	<ul style="list-style-type: none"> • Internal documents that report about external collaboration and teacher team work practices

In the review stage, the secondary sources displayed fundamental differences in organizational logics between academic and vocational domains of the Norwegian upper secondary sector. When the interpretations and inferences were paired with the analytic frames from the exploratory case study, it enabled the research design to address the problem more specifically, and to re-specify the conceptual framework. Secondary data during the first case study helped to identify and specify themes for interviews and observation more specifically. A radical shift in the design was also provoked by inference drawn from secondary data sources, paired with initial case observations. Secondary data has therefore added substantive value, besides contributing to control, comparison and quality assurance. In the second case study, secondary documents were utilized in the ‘retroduction’ loop (Ragin,

⁵⁷ The main body of these large-scale based research reports was a part of a large research project funded by seven regional counties of Norway and the Norwegian Association of Local and Regional Authorities (NALRA). See reports by (Helland, 2006; Helland & Støren, 2004; Markussen & Sandberg, 2005; Markussen, Sandberg, Lødding, & Vibe, 2006). In addition, reports by (Hagen, 2005) and by (Grøgaard, 2006) are analyzed

⁵⁸ Register data is retrieved from Statistic Norway (SSB) and the central intake database of upper secondary education in Norway (VIGO)

1994a), in order to pinpoint empirical categories that were theoretically interesting.

5.6.5 Observation

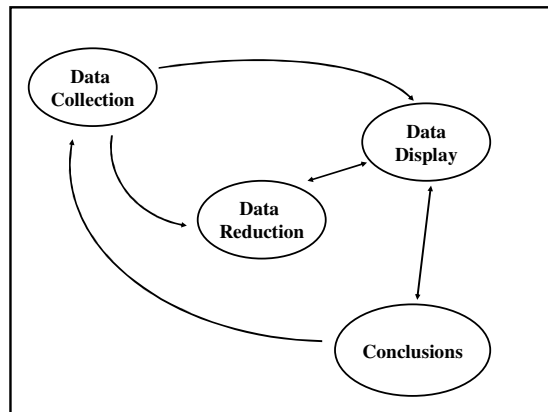
In this study, some minor participative observations have been made. They refer to the researcher's participation in team meetings of the school management and teacher team meetings, as a passive observer to the events and interactions that took place. The purpose was to improve the triangulation of the data, and to validate interpretation emerging from the analysis of other data sources. Notes were taken continuously during the observation, systemized in the form of field notes, which in principle may contribute to increase the reliability of the study. The observation represents a minor, and purely supplementary, data source in this study, and field notes were taken on a limited range of subjects and issues. Both observation sessions provided descriptive accounts that at a later stage contributed to analytical inferences. For example, teacher team observations gained insights to the number of practice repertoires developed.

5.7 Qualitative data analysis

5.7.1 The interplay of data collection and analysis

Data analysis in qualitative research means to analyze texts in one or another form. Qualitative data collection and data analysis are non-separable integrated processes that guide and inform each other: "The process of analysis should not be seen as a distinct stage of research; rather it is a reflexive activity that should inform data collection, writing, further data collection, and so forth" (Coffey & Atkinson, 1996, p.6). The image of data collection and data analysis in qualitative research can be like a 'zigzag' process (Creswell, 1998, p. 57): Out to the research sites to gather data, analyze the data, back to the field to interview more actors, and so on. When the theory is elaborated, in all its complexity, and final conclusions can be made about its scope and validity, the study is then saturated. The relationship between the cyclical operations involved in qualitative data analysis is illustrated in figure 5.3 below.

Figure 5.3: The interplay of data collection and data analysis



Source: Miles and Huberman (1994a, p. 429)

According to Miles and Huberman, two interrelated, tactics are important in the conceptual ordering of the empirical material: *Data reduction* and *data display*. Data display builds on the coding activities and guides the drawing of conclusions, which again informs the further data display and data collection. Data display is defined as an ongoing compressed assembly of information that permits conclusion drawing and/or action taken in a second part of analysis (Miles & Huberman, 1994a, p. 429). Theory-focused displays may include structured summaries, coding trees or network like diagrams. The data display techniques available in the computer program N6⁵⁹ were used to enable the researcher to keep intuitive overview and maintain a thread in the material. Verbatim transcriptions of the interviews were structured and encoded into the format that the computer program requires. Open coding techniques were then practiced, in order to grasp the immediate interpretation of the meaning of the interviews.

Regarding data reduction, the potential universe of data is reduced in an anticipatory way as the researcher chooses a conceptual framework, research questions, cases and instruments. Data reduction is an integrated part of the data display, which enable conclusive judgments all at an early stage, at least related to choices of further data collection. The iterative model gives a fairly good representation of the data analysis of the study, especially in the

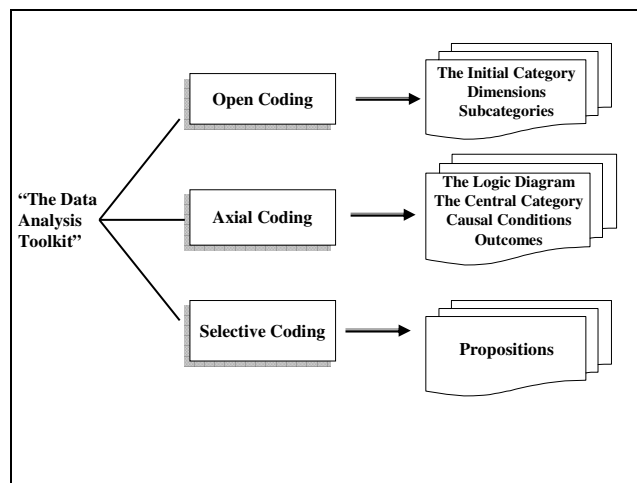
⁵⁹ The computer program was previously known as NUDIST. Current name is ENVIVO. See the website www.qsrinternational.com

early part of process. Data reduction was employed in this study in three distinct forms. *Firstly*, some portion of the interview material was reduced during the analysis, through concentrating on the categories and dimensions that coupled to the conceptual framework. *Secondly*, the shift between the first and second case study represents itself a radical form of data reduction, since some of the observations became first-order and others second-order. Data reduction was also, *thirdly*, an important analytical operation, when secondary text sources were imported to the analysis. The documents were not imported in raw form, since fractions that added information to interview texts were selected for analysis.

5.7.2 Coding procedures

Coding is thus about breaking the data apart in analytically relevant ways in order to lead toward further questions about the data (Coffey & Atkinson, 1996, p. 31). After initial coding takes place data will be resorted according to patterns and themes that emerge from the data (Creswell, 1998, p. 153). The process of qualitative data analysis normally uses a ‘toolkit’ of three distinctive coding strategies; open coding, axial coding and selective or discriminate coding, which respectively provide different outcomes for the elements. The coding procedures and their outputs are illustrated in figure 5.4.

Figure 5.4: The qualitative analysis ‘toolkit’



Analysis procedures are activated when the researcher has started the gathering. At the beginning of the research dialogue, the analytical tool is limited to identifying categories in the data material, centered round a so-called central category that appears frequently in the data material. The process is labeled *open coding*, and the researcher forms the initial empirical categories, based raw data, about the phenomenon under investigation. This means that in the cases investigated, there are indicators pointing to specific concepts that relate directly to the conceptual framework⁶⁰. During the process, the central category will be refined and sharpened, described more abstractly, leading to a category of more theoretical content. Sub-categories of a category can also be identified, and the process of relating categories to their subcategories is termed axial coding (Strauss & Corbin, 1998, p. 123). In this study, the data analysis started with open coding of the interview material. The computer program N6 was used from the early part of the analysis, in order to systemize the coding of the data, and to provide flexibility to the process and reduce the time consumption. *Annotations* and *memos* were extensively used as supplementary tools to pure categorization, in order to map the conceptual content of the actor interviews.

Axial coding is generally described as a follow up procedure to open coding. The key operation in axial coding is to construct the connections between the category and its sub-category in a hierarchical tree-fashion. It is a way to make decisions concerning the category identified: What is the conceptual category, and what are subunits of it? Axial coding was undertaken in all cases, based on the interview transcripts. Some of them generated important theoretical discussions, for example the axis of the ‘dissonance’ phenomenon found in the data. Along with specifications of the learning process, as modeled in chapter ten, these two entities benefited from axial coding. It is, however, worth underscoring that the axis-trees were also subject to substantial data reduction during the analytical operations. Although providing some contributions, axial coding was, however, a secondary operation in the present data analysis.

In *selective coding*, the researcher identifies a ‘story line’ and presents possible propositions. Selective coding played a crucial role in this study, through constructing a story line of the case. The major grip was to build up a system of memos from the single interview to the case. A pure descriptive case memo formed the early start of the construction process, and this entity was based on interview memos and conceptual schemes. For example, an extensive case memo was constructed for each of the sites included in the case study, and these documents were important material for comparative

⁶⁰ Category is defined as “concept that stands for phenomena” (Strauss & Corbin, 1998, p. 101)

cross-case analysis of the two sites. The starting point, however, of the case memos was the open coding. Dimensions are conceptual tools for capturing variation in the material along categories. Both open coding and selective coding were proactively used to capture the learning-adaptation process, the learning context, the repertoire and the middle management practices involved. Grounded on the data, analytical categories were constructed

5.7.3 Data management aided by computer software

The use of the computer software program, in this study N6, serves multiple purposes. First of all, a computer system supports the interrelated processes of data reduction, data display and directing further data collection. Besides, when effectively employed, computer aided tools can be at the heart of qualitative data management. Besides contributing to accessible data, documentation of the kinds of analyses carried out is ensured. This enables retention of data and associated analyses after the study is completed, too. To sum up, using computer software is not a necessity in the analysis of qualitative data, but it provides the researcher with several opportunities for improving data analysis as well as data management, e.g. storage, documentation and retrieval. In this study, the use of the computer program primarily served management purposes though it should not be underestimated that the availability of the coding tools made the analytical process ‘smoother’. Moreover, the use of the computer program ensured that the researcher constructed an audit trail that accesses external inspection to the material.

5.8 Validity and reliability

In order for the study to exert any influence on theory building or the field of practice, the findings must contain a certain level of credibility and trustworthiness. The insights and the inferences transmitted must be perceived as credible to scholars and practitioners within the actual field of enquiry. Moreover, the findings and inference must be transferable to a larger social grouping than those under investigation. The issue of reliability and validity must therefore be addressed at the earliest possible stage, especially in the construction of the research design.

5.8.1 Reliability

Reliability refers in essence to the extent to which the findings of a study can be replicated (Yin, 1994). It must be likely that a subsequent research project would end up with similar findings, given the identical research questions and the similar use of procedures, tools and techniques. However, most research is *not* replicated by other scholars or students in practical terms. This ideal must therefore be realized through other means. The reliability criterion then boils down to the extent to which other researchers would be able to reach agreement - that the findings and the inferences make sense. It is argued that the reliability of a qualitative research design can be assessed through *dependability* and *consistency*. Dependability is ensured through the development of an audit trail in the study that provides both stability of the data and makes it possible to control and assess the tracks of the stream (Lincoln & Guba, 1985). An audit trail has been developed through the computer system *N6* aimed at documenting the researcher's steps and movements through data collection, analysis and interpretation. The data sources, i.e. the verbatim transcriptions from the interviews, are carefully ordered in the computer system, so that others can easily retrieve each data entity. The text units are organized so that it is easy to follow the interview dialogue systematically.

Furthermore, the researcher's annotations and interview memos are connected to the text unit to which they belong. By using a simple function key, a reviewer can inspect the evolvement of the researcher's interpretative work during the interview dialogue. The text units are also carefully marked with codes that easily link them to the informants and the research sites they are drawn from. In this respect, text units can be controlled and compared systematically with the interpretations made in the case memo from each of the research sites. Besides, qualitative scholars emphasize that it must be possible to assess and confirm the extent to which the interpretations of the researcher are grounded in events rather in the inquirer's personal constructions. In the study reported in this thesis, building a systematic audit trail of the reporting procedures has been an important vehicle in the efforts of ensuring reliability in terms of a transparent body of data that can easily be trailed by external parties. Audit procedures are therefore the fundamental operations through which external reviewers can ensure the credibility of the study.

Consistency is sought to be achieved through *triangulation* of methods and *replication* of observations. Issues, themes and whole interviews are replicated in the same uniqueness of context, in order to prevent

‘superstitious’ or biased inferences. The critical incidents and patterns in particular have undergone crosschecking and replication.

5.8.2 Internal validity

Internal validity concerns the internal logic and consistency of the research, and refers to the extent to which the findings and inferences are based on valid interpretations and comparisons (Punch, 1998). Internal validity can be enhanced by triangulation, where multiple data collection methods and analysis procedures can strengthen both reliability and validity. Triangulation involves crosschecking findings by using different sources of data. Reliability and internal validity considerations were imputed to the design all from the early stage, through the proactive use of multiple data sources in concert. For example, critical events emerging during interviews were, as far as possible, crosschecked against secondary documents collected from the research site. Such documents were for example minutes of meetings, protocols, plan documents, time schedules, annual reports, project reports and student evaluation reports. A considerable body of secondary data documents was therefore gathered during the interview processes, which were closely related to the topics on the agenda during the interviews.

Another practice that may promote internal validity of the study is through contesting data and interpretations of interviews against the people and groups to which the interpretations refer. For example, themes referring to collaboration among teachers were taken up in interviews with middle managers and principals. These themes were then taken up in team interviews and were also crosschecked against document evidence. The internal validity was also sought to be increased through the replication of interviews, in terms of follow up interviews of the same participants focusing on the same themes and issues as in the first session. In this way, the criteria of credibility, consistency and truthfulness of interpretations and findings were sought to be addressed. The interplay between the techniques employed is sought to provide internal validity to the study.

5.8.3 External validity

External validity refers in principle to the potential for generalization based on the findings of the study. Are the inferences transferable to other settings and contexts? The researcher has clearly laid out the details of the research

context, data collection and analysis, so that external reviewers and readers may judge the issue. Three of the chapters of the thesis lay out the characteristics of the context under investigation, i.e. the educational field as well as a detailed description of the research sites of the main study. This enables the reviewer to make independent judgments about the extent to which interpretations and findings are bound to the specific context under investigation.

Moreover, what are the boundaries and limitations of the transferability? Some of the findings will no doubt refer to context specific contingencies; for example, the context bound variables inherent in the distributed training curriculum found in the Norwegian context. Triangulation is also recommended as a tactic in the pursuit of external validity. The main case study is conducted through two sub-cases that are close to most similar cases, which in itself represents a replication method. Another triangulation strategy has been to conduct the interplay between in-depth case study investigation and analysis of large-scale secondary data. In this way, a correspondence between field-specific evidence and case –specific evidence has been established.

5.9 Limitations of the study

Certain limitations of the study are discernable. Specifically, I will address five shortcomings and limitations. *Firstly*, the level of analysis of the study is subunit, which in conventional terms means the subject department of the school organization. In secondary education, subunits correspond with the knowledge domains, the technical core of schooling and the territory of authority of the middle manager. This micro level constituent is crucial for understanding the core logics of upper secondary schools. However, variation across subunits is not analyzed systematically because the research design and data collection methods have not allowed this operation. In a similar vein, the strength of the relationships indicated, for example, knowledge broker categories among middle managers, is for similar reasons not captured and analyzed. This limitation is a function of the chosen research strategy and design. Case studies may be in favor when contextual conditions and contingencies are important for the phenomenon under investigation. This is no doubt the case in this study. On the other hand, partial relationships are difficult to capture systematically in a case design (Andersen, 1997). In consequence, the central findings of the study are restricted to prototypical models, where variation in scope and applicability is not captured.

Secondly, due to limitations in data collection methods and design, evidence on network relationships is restricted to the school side. The occupational network relationships represent a key component of the distributed community of practice, but the inference is based on one-sided investigation. The workplace side of the social network ties are thereby absent in the analysis, which may have blindsided me to overlook important aspects. *Thirdly*, analytical limitations are also due to the small scale of the study, and refinements and further elaborations of theoretical concepts would benefit from testing in a larger sample of school actors.

Fourth, the data analysis makes extensively use of sensitizing and tentative constructs, such as the one of the knowledge broker. These are not well developed in the theoretical areas they are applied, and they must therefore be regarded as a tentative and suggestive framework. The community of practice construct is in itself criticized for being 'elusive' and 'slippery' (Barton & Tusting, 2005), which anyhow underscores the sensitizing nature. It is also a relatively novel construct, at least applied to organization studies. The point here is that the status of the theory inhibits limitation of the study. *Fifth*, the findings are to some extent context specific. On the other hand, the baseline assumptions that have guided the methodological choices argue that context matters in educational studies. Some of the main findings are obviously context bound to Norwegian vocational training, for example those emerging from the structure of the training curriculum. Turning to other educational contexts, for example academic schooling and higher education, the value is limited.

5.10 Summary

As seen, three bedrock considerations have guided the methodological choices during the study: Research as a dialogue, an exploratory-integrative strategy and a case oriented approach. The dialogical conception of social science research has guided the research process during the different stages, where exploratory inquiry has been sought to combine with a strict theory focus. The shift between the exploratory and the strict theory focused stages is represented by the critical point, where the investigation was narrowed towards a single case study based on two sub-cases. Flexibility and sensitivity have been important strategic variables in the initial part of the research process, which has enabled the researcher to adjust the design as the analytical properties emerged from the evidence.

The body of empirical evidence is built upon various sources of primary and secondary data. A great number of secondary sources are quantitative

register data gathered in large-scale longitudinal samples. These sources of information are matched with in-depth case observations, grounded on qualitative procedures. The analysis therefore shapes an iterative loop between large-scale evidence about the context, in which the cases are embedded, and close actor observations. Different tactics have been used to enhance reliability and validity, and this instrumentation has been employed during the construction of the design, in data gathering and the analysis process. The main tools are conscious construction of insight mechanisms through audit trails, manual as well as computer-based. Besides, different forms of triangulation and replication tactics have been employed, in order to increase and assure the consistency of the findings. In terms of external validity, the decisive test boils down to transferability beyond the specific context, i.e. Norwegian vocational training, of which the evidence is collected.

Chapter 6: Analysis of the external environments

6.1 Introduction

Chapter 6 introduces the empirical section of the thesis. Since the research problem addresses how school actors adapt their practices to externally imposed demands, it is important to capture the nature of the external environments in a relatively precise manner. Specifically, empirical characteristics of the various environments to which Norwegian vocational training institutions relate have been subject to investigation. The purpose of this chapter is to construct analytical frames, grounded on evidence, that improve the understanding of the external contingencies, constraints and demands that school professionals have to take into account. The analysis is grounded on various sources of data collected by multiple methods: Longitudinal student cohort data, drawn from research reports and official databases, paired with observations made during the exploratory case study. The essence of the analysis indicates that vocational school actors systematically have to deal with more technically oriented demands, at least compared with their academic schooling counterparts. As elaborated in chapter two, the term *technical* denotes that external demands imposed by either the governance system, or by working life stakeholders, exerts some direct influence on the conditions of instruction.

Moreover, technical demands are typically connected to some kind of assessment and sanctions. In consequence, these types of demands will typically be difficult to ignore, if successful completion of the students' training program is to be ensured. Buffering and symbolic adaptation⁶¹ will therefore not be successful strategies, at least in the long run. As proposed by the thesis, integration of students into apprenticeships therefore relies heavily on proactive adaptive strategies from the school's side. However, school actors of vocational training are not only confronted by technical demands. They are also assumed to be influenced by broad institutional norms and dominant belief systems that have gained hegemony in the school's institutional environments⁶². Policy analysis has for example brought evidence that the egalitarian and inclusive Norwegian legacies remain strongly defended by a dominant coalition in the school's environment⁶³. The core of this legacy coheres round the notion of the

⁶¹ See Brunsson (1989); J.W. Meyer & Rowan (1977)

⁶² See Scott and Meyer (1991); Scott (1995)

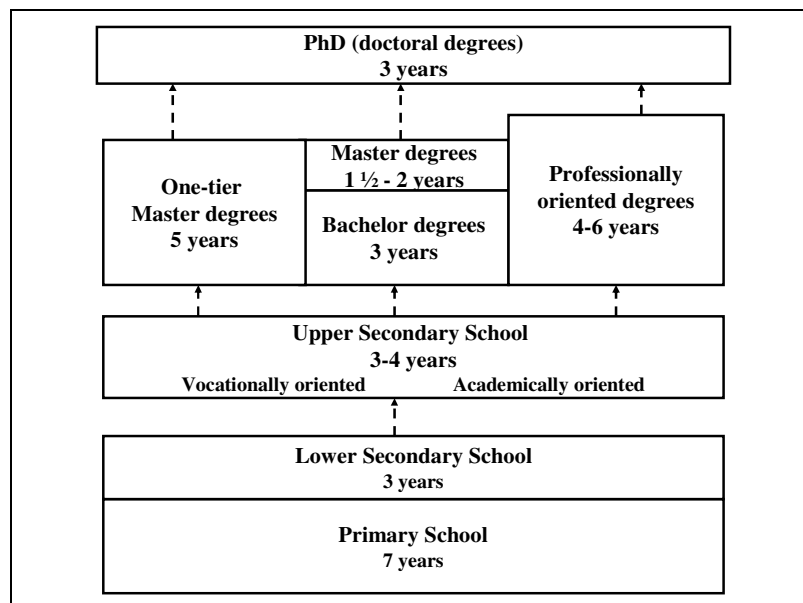
⁶³ See Welle-Strand and Tjeldvoll (2002)

unified school⁶⁴. This form of path-dependency is therefore assumed to exert some substantial influence on organizational behavior of schools. The chapter proceeds as follows: A brief overview of the Norwegian educational system is followed by the essence, seen from the rational of this study, of the Norwegian policy legacy. Thereafter, recurrent challenges within Norwegian vocational training are analyzed. Emphasis is on the school-environment relationships inherent in the Norwegian distributed training curriculum.

6.2 The four-tier structure of Norwegian education

The Norwegian educational system is divided into four tiers. After three comprehensive legislative reforms in the 1990s, the educational system is structured into a relatively coherent framework. A map of the four-tier structure is displayed in figure 6.1.

Figure 6.1: The structure of the Norwegian Educational System



⁶⁴ The central aims of the 'unified school' model are to ensure the rights of all children and young people to enter and fulfil primary and secondary education in their home environment, independent of their abilities, social status or where they live (Opheim, 2004; Tjeldvoll, 1998).

Accordingly, the 1990s was one of the most thorough reform-periods in the history of Norwegian education, affecting nearly all aspects and levels of the system. The reform, known as 'Reform 1997', changed the period of compulsory schooling to 10 years, with the obligatory admission of six-year-olds as opposed to earlier. Simultaneously, the systemic reform labeled 'Reform 1994' ensured all young Norwegian people between 16-19 years of age the statutory right to enter upper secondary education in their home environments. The antecedents of 'Reform 1994' were a stable growth period, characterized by systematic up scaling of the enrollment capacity throughout the whole country in the 1970s and 1980s (Opheim, 2004). The admission rate in upper secondary education was thereby raised to more than 80 % at the end of the 1980s (Bergesen, 2006). The major aim of 'Reform 1994' was therefore not primarily to raise the admission level, but rather to include former residual groups that systematically fell outside the system (Iván, 1998). Due to the new intake regime, upper secondary education today is provided throughout the country, and is designed to make equivalent courses available to most applicants.

In the tertiary sector, the curriculum structure was streamlined through the 'Quality Reform for Higher Education' that was implemented stepwise from 2003. One of the major purposes was to improve the match with international degree standards. Consequently, certificates and diplomas from Norwegian higher education institutions today are combinable with international programs. Most universities and university colleges in Norway are state owned and publicly funded, and there is no student fee demanded from the students in the public institutions. Moreover, the enrolment capacity of Norwegian university colleges and universities is relatively high. There are, as such, relatively few barriers to students wishing to continue their education in the tertiary sector after they have left academic upper secondary schooling.

6.3 The institutional environments

6.3.1 Institutional framework as analytical tool

The theoretical framework of the thesis sees an educational system as a multi-level institution. Following Scott's (1995) approach, a national educational system can fairly well be approached as a societal institution grounded on three pillars, respectively the regulatory, the normative and the cultural-cognitive. The institutional perspective, as such, sees education not only through the lenses of structure and regulations, i.e. laws, directives, curricula and governance structure. The perspective rather recognizes that

dominant professional norms, belief systems and ideologies are powerful constituents of an institution. The perspective takes into account that the behavior of educational actors is not entirely determined by regulations. Rather, it is assumed that school behavior is also significantly affected by purely social obligations, for example, dominant professional norms⁶⁵. Besides, cultural-cognitive demands, rooted in ideologies and belief systems among strong stakeholders, may also impose considerable environmental pressures and demands on the individual school organization. In other words, the school's environments are not only a function of regulations and structures, but also of professional norms, belief systems and ideologies anchored in the dominant coalition of the school's environment. In the Norwegian case, policy research points uniformly to the influential role of the unified school ideology, not only as a belief system, but also as a normative basis for education in practice⁶⁶.

6.3.2 The Norwegian unified school institution

Since the early 20th century, Norwegian educational policy has been strongly influenced by egalitarian values. Equality in education has thus been a governing policy ideal for decades. The equality term denotes an overall goal emphasizing that the provision of the same resources and opportunities should be available to all students, independent of their socio-economic and cultural background. A central aim inherent in the unified school has therefore been to produce equal opportunities for all, irrespective of abilities and conditions⁶⁷. The core of this legacy reflects an ideal that the educational career of the individual would be determined by abilities and interests, and not by social status and place of residence.

In practical terms, politicians have sought to achieve distributional justice through expansive capacity building, in order to make schooling available even in the most remote areas. The historical precedents for this ideal can be traced all the way back to the General Education Act of 1739⁶⁸, which can be seen as the starting point of an evolution towards the contemporary school institution that ensures compulsory education for all children in Norway. In the 18th century, however, educational attainment was still heavily dependent

⁶⁵ See Rowan (2002a); Rowan and Miskel (1999)

⁶⁶ See Lauglo (1998); Tjeldvoll (1998); Welle-Strand and Tjeldvoll,(2002)

⁶⁷ See Welle-Strand and Tjeldvoll, (2002, p. 674)

⁶⁸ The Norwegian Act of compulsory schooling of 1739 stated that "equality should be realized whereby all children, irrespective of their parents' social position and class, should be accorded a certain basic useful and necessary education" (Opheim, 2004, p. 20)

on social background, as education did not provide the student resources for elevation into another class in society, other than in which the child had its rightful place. The system was to provide the individual with skills appropriate to his social background, and the educational system permeated values of social stability.

From this historical position, the philosophy of educational equality gradually evolved in practice, through the dissolution of the old parallel school system, and towards a nation-wide unified public school, based on comprehensive mass education. The post-war period, characterized by growth in welfare state arrangements, therefore saw major changes in Norwegian education. While presented as an effort to eradicate social differences, a key ambition inherent in the reform waves was also to better utilize the talent reserve available in the population. *First* of all the educational reforms sought to make educational attainment available for all social groups. *Secondly*, the educational reforms sought to provide educational opportunities for pupils in rural areas. By 1969, nine year's compulsory schooling ensured that everyone through the country was entitled to enter lower secondary schooling. The next reform wave then targeted the upper secondary level.

In the early 1970s, however, upper secondary schooling was restricted to a relatively small part of each age cohort. The enrollment capacity of upper secondary schooling was therefore increased during the 1970s and the 1980s, by means of several comprehensive reform projects. Funded by the state and managed by the regional counties, a series of huge construction projects was launched, resulting in many new and timely school buildings throughout the country. A large portion of the new schools found their locus in the rural districts of the country. Moreover, the established parallel system, with strict divisions between the gymnasium school and vocational training institutions, was a bottleneck for building a unified system. The level of vocational qualifications was therefore raised, by means of comprehensive curricula reforms and massive teacher education. As a rule of thumb, teaching in vocational and mercantile lines required lower qualifications than in the gymnasium school, simply because the teachers should serve in programs of one-year duration directed towards working life certification. The school reforms of the 1970s therefore sought to upgrade all kinds of vocational schooling to the standard of three-year duration, in order to construct a coherent upper secondary sector, and thereby expand the unified school ideology to the middle level of the educational system.

6.3.3 A qualitative shift in the 1990s

Whereas policy makers in Norway in the 1950's and the 1960's emphasized equality of opportunity through structural reforms and expanded enrollment capacity, changes in the unified school conception were observed from the 1970's⁶⁹. Politicians, representatives of the teaching profession and educationalists increasingly argued that providing opportunity was not a sufficient condition to fulfill the unified school policy in practice. The policy ideal gradually changed, from equality of opportunity, towards the idea of equality of results. From the latter perspective, providing the same opportunity was not enough, because different people would need different kind of opportunities, and some would need more support than others would to be successful⁷⁰. If children from different backgrounds were to have similar opportunities in life, they would have to be treated differently⁷¹. The underlying line of argument stated that equality of results would necessitate inequality of provisions and distribution of resources. The ideology indicated that the state was not only responsible for providing opportunities for all to participate in education, but also for whether people were actually successful in doing so.

The shift reflects a more general debate of what equality in reality means. For example, the educational policy literature has distinguished between different facets of the equality concept, encompassing equality of access, equality of survival (the capacity to fulfill the completion cycle), equality of outputs (of schooling) and equality of outcome, i.e. the societal capitalization of the individual's educational outputs⁷². In this respect, the qualitative shift of the 1990s represents a move towards the emphasis of equality of outputs. The extended unified school model, rooted in a more comprehensive version of the equality conception, is manifested in three areas of practical reform policies of the 1990s:

Firstly, at the upper secondary level, the inclusive school principle was strengthened through the new intake regime inherent in 'Reform 1994'. In many respects, the structural side of the reform was a 'youth reform', because it removed the barriers the youngest applicants met in the intake system. However, the new intake regime not only granted statutory right for all applicants but a governing norm also emerged, stating that one of the applicant's top-three priorities should be offered by the schools of their home environments. This regulatory change implied an intended shift in

⁶⁹ See Slagstad (1998)

⁷⁰ See Opheim (2004, p. 21)

⁷¹ See Støren and Skjersli (1997)

⁷² See Farrell (1992) for a policy review of educational equality

student population, because it gave young applicants a premium right at the expense of older candidates⁷³. Moreover, the reform granted access for students with disabilities and special needs. In consequence, most upper secondary schools gradually started to build up their capacity in special education and social services, in order to deal more efficiently with more demanding groups of students.

Secondly, the state-owned special schools were closed during the 1990s, and pupils and students with various types of disorders should attend their local schools, normally in the same class as students without such problems. Both primary and secondary education was affected by this systemic restructure (Midthassel, 2004). *Thirdly*, the principle of adapted teaching and learning was introduced in 'Reform 1994'. This means that most aspects of educational provision, such as curriculum, teaching and materials, shall be organized to meet preconditions and needs of the individual student. The students' legal rights to expect their learning environments to be adapted to their preconditions were further strengthened in the Education Act of 1998. Review of how adapted teaching and learning is understood among practitioners and researchers shows, however, a relative blurred picture when it comes to conceptual content and meaning⁷⁴.

This image was confirmed and amplified when discussing the issue in interviews with middle managers and school principals during the case study. The examples listed, indicate that the unified school model has not been a consistently understood set of policies. Politicians, stakeholders and professional groups have put different content into the concept at different times. It is fair to interpret the main trends of the 1990 reforms as a shift towards more individually tailored education, paired with a more inclusive intake regime, rooted in the notion that the public school system should take responsibilities for all youngsters. The thesis suggest that these broad ideas shape normative and ideology-driven 'belts' in the schools' environments - resulting in more inclusive demands. Equally important, it is stated that the extended unified school conception forms sets of technical demands imposed on school actors in practice, through the intake regulations. The changes have institutionalized a more complex work context for teachers and school managers, in primary as well as in secondary education, due to a more heterogeneous class population⁷⁵.

⁷³ See Grøgaard (2006)

⁷⁴ See Bachmann and Haug (2006) for a review of the literature on adapted teaching and learning

⁷⁵ See Opheim (2004)

6.4 Revising the Norwegian upper secondary sector

The major growth in Norwegian upper secondary education towards a mature educational sector took place in the 1970s and 1980s. At the heart of the reforms was the new upper secondary legislation of 1974 followed by a stream of regulations and directives. This regulatory basis integrated most lines of upper secondary schooling into a coherent national framework of national curricula, tariff agreements and teacher credentials. The sector was coordinated by a central state department body, but in 1976, powers and authorities to govern the schools were transferred from the state department to the 19 regional counties.

A series of new schools were constructed, and as a rule of thumb, these were designed to house the full range of fields, academic as well as vocational ones. This design prototype is termed a combined school, which has been the standard parameter of designing Norwegian upper secondary schools since the mid-1970s. In consequence, Norwegian upper secondary schools are large complex organizations grounded on a diverse range of distinct knowledge domains. Considerable internal diversity and fragmentation must be expected, due to the fact that the subject domains reflect different traditions of teacher recruitment, curricula and pedagogical orientation as well as teacher training⁷⁶. The collection of knowledge domains is normally structured in distinct subunits, labeled subject departments, which constitute the technical core of the Norwegian upper secondary school organization.

Although the 1970s and the 1980s formed a continuous growth period, some major challenges were observable in the early 1990s. *Firstly*, the educational authorities had to face and acknowledge that some groups systematically fell outside the system. The most severe problem was an increasing number of dropouts that left the system without any qualifications⁷⁷. *Secondly*, the curriculum structure of the sector had developed dysfunctional sides, because the number of foundation courses had escalated. Premature and irrational student preferences led to several wrong choices resulting in an overdubbed course-portfolio, which was possible through collecting redundant foundation courses. This dysfunction was also a result of the fact that the younger students had to compete with their older counterparts to gain access to the advanced courses. *Thirdly*, the vocational training sector had demonstrated severe problems that needed action. Generally, the vocational field had lost considerable legitimacy through a declining status among the youngsters, at least compared to preparatory schooling for higher

⁷⁶ See Paulsen (1999a)

⁷⁷ See Iván (1998, pp. 197-198)

education. Even more important, it was claimed that there was weak interaction between school and working life. It was also difficult for the youngest students to achieve an apprenticeship contract, simply because they had to compete with older candidates. In 1991, seven out of ten apprenticeship contracts were awarded to students between 18 and 22 years old (Grøgaard, 2006).

The policy makers therefore intended to prioritize younger applicants through their strategic instrument, the designed policy framework of 'Reform 1994'. The rule of 'guarantee-student' was an important component, which means that applicants from lower secondary school were to be prioritized, in contrast to in the old intake regime, where they had to compete with older colleagues. The distribution of students between academic and vocational lines of study is close to 50/50, and the share has been relatively stable over several years. Table 6.1 shows the distribution of students and apprentices enrolled in upper secondary schools in the interval 2003 - 2006.

Table 6.1: Students and apprentices in upper secondary education

Students	2003-2004	2004-2005	2005-2006	2006-2007
Students total number	176 529	173 949	182 926	185 934 ⁷⁸
Students in academic lines	52.9%	52.0%		
Students in vocational lines	47.1%	48.0%		
	100.0%	100.0%		
Apprentices in workplace programs	28 490	29 019	31 316 ⁷⁹	

Source: The VIGO database. Downloaded from www.udir.no 19.08.2006

A substantial shift in both the number of enrolled students and apprentices in workplace programs was displayed in the 2005 data material. The shift is caused by substantial increases in actual enrolment, along with about 3 000

⁷⁸ Updated per 19.08.2006. Retrieved from VIGO, www.udir.no

⁷⁹ This figure is retrieved from Statistics Norway. Downloaded 15.06.2005 from <http://ssb.no/emner/04/02/30/vgu/tab-2006-06-15.html>

new apprenticeship positions⁸⁰, but the numbers are also affected by some minor changes in the register routines⁸¹.

Moreover, in order to couple the vocational courses tighter to working life realities, a new national curriculum of vocational training was launched in 1994. The model encompasses a four-year training program of equally weighted in-schooling and job training in workplaces⁸². The training curriculum implies that students start their program on a relatively broad foundation course of one-year duration. The foundation course is followed up by a more narrow, specialized and branch-specific one-year advanced course⁸³. After the completion of the advanced course, the students have to apply for an apprenticeship position in the local working life, in order to complete the training program towards a craftsman's certificate. The shift between the two discrete structures of the training chain, however, is not safeguarded by any guarantee instruments. In principle, it is up to working life institutions whether or not they prioritize intake of apprenticeships. In other words, there is a resource-based side of the training curriculum, and these critical resources have their locus in the school's local environments. The effects of this training regime are analyzed in a subsequent section.

6.5 Study progression, completion and dropout

A considerable body of empirical evidence has exposed severe quality problems within the upper secondary sector in the period following the implementation of 'Reform 1994'. The twin-problems of dropout and delayed study progression have been stable and consistently reported during most of the period since the implementation. The major trend displayed by the various data sources consistently informs us that approximately only 60% of the students complete their programs within the estimated normal time, so-called optimal study progression. The various data panels also expose a stable dropout rate of about 25%, which means that one out of four

⁸⁰ Information downloaded from www.udir.no 16.08.2006

⁸¹ Information downloaded from www.udir.no. There are small variations in the number of enrolled students across different data sources. These are due to the point of time for counting the students in different data systems. Besides, there are some differences between statistical materials based on school year versus calendar year.

⁸² The training curriculum is most commonly labelled the "2+2 model" (Grøgaard, 2006). As stated, I use the term *distributed curriculum* to coin the arrangement.

⁸³ For example, from the platform of the foundation course in mechanical trades, a series of industrial specializations may be chosen. Similarly, from a foundation course in healthcare and social services, a range of specializations are directed towards healthcare workplaces

enrolled students leave upper secondary school without any kind of qualification. Large-scale official register data has investigated this pattern among complete student cohorts⁸⁴ in time serial designs that allow for a more accurate analysis of this problem. I have retrieved complete data sets of four student cohorts, in order to capture their status five years after the students started in their foundation course. In practical terms, this means for example, that the 1994 cohort is measured in 1999. Table 6.2 displays horizontally the distribution of completion data for each of the cohorts.

Table 6.2: Completion among four student upper secondary cohorts

Cohort	Total of students	Completed normal time	Completed extended time	Still in school after 5 years	Dropout	Total
1994	54 425	60%	10%	5%	25%	100%
1997	52 676	57%	13%	5%	25%	100%
1998	52 821	59%	12%	5%	24%	100%
1999	51 300	59%	11%	5%	25%	100%

Source: Statistics Norway⁸⁵

Longitudinal data panels drawn from the central intake system of the Norwegian Educational Directory consistently confirm the main trend reported by the longitudinal Statistics Norway data. There is a stable completion⁸⁶ rate of 60% for the upper secondary sector as a totality. Furthermore, the data panel report about a stable and problematic dropout rate of 25%, which means that of one out of four students leave without formal certificate qualifications. In essence, the publicly available evidence shows, one on hand, that young people take advantage of their formal rights

⁸⁴ The term cohort defines in this setting the starting point of their foundation course in upper secondary school. For example, the 1994 cohort started their upper secondary program in August 1994. Longitudinal data allows for computing the numbers accurately in the cohort where they actually belong.

⁸⁵ Downloaded 15.6.2006 from: <http://ssb.no/emner/04/02/30/vgogjen/tab-2005-09-22-01.html> Published 22.09.05.

⁸⁶ The term completion, i.e. completed education, means either that the student has passed all exams and courses in upper secondary school within normal time, i.e. 3 years, or that the apprentice has achieved the craftsmanship certificate after 2 years in school and 2 years in apprenticeship in a approved workplace institution (Markussen & Sandberg, 2005).

to enter upper secondary schooling⁸⁷. On the other, a considerable number of them face severe barriers and progression problems during their study careers, and finally, a large portion drops out of the system.

6.6 Revising the vocational training field

6.6.1 Study progression and dropout

Registered data on study progression, completion and dropout, exposes substantial differences between the academic schooling and vocational training sectors. This inference runs through both the reviewed secondary data reports of the NIFU-STEP study⁸⁸, as well as the panel data retrieved from the Statistics Norway database. When splitting academic and vocational categories, a pattern of substantial within-sample differences is displayed. Among the academic students of each cohort, about 75% complete their courses on schedule, whereas only about 13% drop out of school. As seen in the table, the rates are far more dramatic within the vocational training field. The distributions are displayed in table 6.3.

⁸⁷ The regional authorities, the 19 counties of Norway, have as a rule of thumb practiced the statutory right regime in the way they see themselves obliged to offer the applicants one of their top three choices within their home environments (Iván, 1998, p. 199). Data panels from Statistics Norway show that approximately 91-92 % of the applicants are offered a foundation program in their home environment, and this share has been stable over time.

⁸⁸ The evidence is based on large-scale investigation of three student cohorts that started their foundation course respectively in 1999, 2000 and 2001. The data sample was, however, restricted to 7 out of 19 counties, and these 7 counties were all located in the central eastern part of Norway (Helland, 2006; Helland & Støren, 2004; Markussen & Sandberg, 2005; Markussen et al., 2006)

Table 6.3: Completion rates of academic and vocational students

Cohort	Total number of students	Completed normal time	Completed extended time	Still in school after 5 years	Dropout	Total
1998 academic	27 698	75%	9%	3%	13%	100%
1998 - vocational	25 123	41%	16%	8%	35%	100%
1999 - academic	27 097	76%	8%	3%	13%	100%
1999 - vocational	24 203	40%	16%	8%	36%	100%

Source: Statistics Norway⁸⁹

The data on vocational training exposes that only about 40 % of the students of the 1998 and 1999 cohorts have completed their vocational training program, measured five years after they were enrolled into the foundation course. The dropout rate displays that about 35% of the cohort has left the vocational training program they were enrolled in five years ago. The dropout rate has caused serious concerns among school administrators, bureaucrats and policy makers⁹⁰. Nevertheless, the central inference based on the available data sources point to the fact that vocational training is a significantly different educational territory, compared with academic schooling, when it comes to study progression and dropout.

The main picture drawn from the register data corresponds fairly well with more recent research reports, based on longitudinal data. The main message is a significant difference between academic and vocational students when it comes to study progression and completion. The progression ratio is consistently reported to be around 85% for academic students and close to 30% lower for the vocational counterparts. However, for both main categories, the rate of optimal study progression is about 10% higher than in the figures of the Statistics Norway data. This difference is most probably due to sample bias in the NIFU-STEP studies, not at least because the sample is restricted to seven counties in the Central-Eastern part of Norway. For example, data from the county of Finnmark is not included, and in

⁸⁹ Published 22.09.05. Downloaded from: <http://ssb.no/emner/04/02/30/vgogjen/tab-2005-09-22-02.html> 15.6.2006

⁹⁰ See Hagen (2005)

earlier investigations, students from this region have shown a lower level of study progression⁹¹. Rates of optimal study progression of this particular investigation are shown in table 6.4 below.

Table 6.4: Students with optimal study progression

	Optimal study progression of the 1999 cohort	Optimal study progression of the 2000 cohort	Optimal study progression of the 2001 cohort
Academic lines	83.7%	84.8%	81.8%
Vocational lines	55.6%	56.9%	56.2%
N (total)	47 185	47 309	47 823

Source: Helland and Støren (2004, p. 30)

The essence of the secondary data consistently reports a severe twin-problem of completion and dropout within the vocational training field. The evidence reviewed therefore uniformly points to the inference that the core technology of vocational training is distinctly different from academic schooling. The curriculum is different in its distributed nature, as well as is the quality of student learning and outcomes deviate across the two main sectors of Norwegian upper secondary schooling.

In an additional large-scale longitudinal study of the 1994 student cohort⁹², the fuzzy and complex career path of students is further analyzed. The researcher follows the panel over a period of six years. The evidence confirms the progression pattern reported previously in this chapter where a large portion of the 1994 cohort struggle with completing their upper secondary programs. Six years after the members of the data panel, drawn from both academic schooling and vocational training, started on their foundation course, 27% of them have so-called competence at the lowest level, which means that they have no formal diplomas or certificates. In addition, the pattern of significant within-field difference between academic and vocational students is strongly confirmed: 40% of the students that started their vocational foundation course in August 1994 have no formal competence at all six years after their enrollment. This practically means that

⁹¹ See Hagen (2005, p. 15)

⁹² Jens B. Grøgaard has investigated the shifting career path N= 2809 among the student cohort that started their foundation course in August 1994 (Grøgaard, 2006)

40% of the vocational training students have failed to achieve a craftsman's certificate (Grøgaard, 2006).

6.6.2 The 'bottleneck' problem

More than a decade after the implementation of 'Reform 1994', it seems fair to interpret the ambitious goals of the reform as not having been reached in the vocational training field. Sufficient apprenticeship positions in working life are no doubt preconditions for the distributed vocational training model to work in practice. When a gap in available contracts is present, the training chain is broken, and a mismatch between policy intentions and realities exists. Table 6.5 presents register data on achieved apprenticeship positions.

Table 6.5: Applications and achievements of apprenticeship contract

Category	2005	2006
Applicants for apprenticeship	16 763	16 433
Number of applicants with contract	7 670	7 918
Ratio	45.76%	48.18%

Source: The VIGO system. Downloaded from www.udir.no 19.8.2006

The data indicates that only half of the applicants end up with an apprenticeship contract. However, behind the rate of missing apprenticeship positions is a complex pattern. From the employers' point of view, the workplaces are in a situation where they can select their recruits from a pool of available candidates. From the perspective of the students, the situation is opposite, because a large number of them necessarily either have to wait for an apprenticeship contract for a subsequent period, or to change their education plan. Consequently, it is fair to interpret this stable situation as a bottleneck problem, where the rejected candidates are put into some kind of a vacuum.

Although fluctuations in time due to economic growth conjuncture may affect this situation, the evidence supports the image that gaps in apprenticeship positions emerge as a major barrier that impedes successful completion of vocational training. When the number of available

apprenticeship positions is insufficient, compared with the number of students leaving their second year of schooling, a gap in the vocational training chain exists. A gap between available resources and needs may be seen as a case of *dissonance* for both students as well as for the vocational school, which has to face the formal rights of the student. Moreover, because the acceptance power lies in the working life, the schools normally see themselves as more dependent on their external working life environments than earlier.

6.6.3 The return problem

The reviewed evidence indicates that the ‘bottleneck problem’, the gap in apprenticeship positions available, is mediated by other mechanisms. One such mechanism is labeled the ‘return path’, and it counts for the case when a number of students return to schooling after being rejected as apprenticeship applicants in the workplace. When students fail in achieving an apprenticeship position, which in practice means that their training chain is broken, they may return to school, where they are offered a tailored academic advance course as a ‘substitute’ for incomplete training. However, there is little doubt that such substitute offers deviate largely from the original preference structure of the training candidates. When this compensation path is investigated in a longitudinal sample of applicants that fail to get into apprenticeship⁹³, other problematic sides are displayed: The students that return to school, after having met barriers in the market for apprenticeship position, face several problems.

The ‘returnees’ then experiences several learning barriers and study progression problems when they try to fulfill their substitute course in general academic subjects⁹⁴. The reviewed research reports indicate that substantial groups of vocational training candidates face these kinds of barriers. However, the return cases are not listed as dropouts. The investigation of the ‘return’ paths displays for example a significant shift in career path between the second and the third year in the training program: At the end of the second year, 43.4% of the sample followed a vocational program, whereas 45.7% followed an academic course of study. Half a year later, the percentage of vocational students (among the same data sample) is reduced to 27% of the cohort. The share of academic students was then

⁹³ Markussen and Sandberg (2005) have examined this pattern by means of a group of 1056 applicants to apprenticeship drawn from a larger sample

⁹⁴ See data displays reported by Markussen and Sandberg (2005, p. 29)

increased to 56.3%. As interpreted by the researchers: “This is interesting as long as we know that 52% of the leaving cohort from lower secondary school applied for a vocational program” (Markussen & Sandberg, 2005, p. 20). The essence of the data portrays a pattern, where the lack of apprenticeship positions represents a ‘bottleneck problem’ of the distributed training model. As a compensation strategy, rejected students return to a designed academic program, where they in the next turn face study progression problems and learning barriers in a subsequent period. This substitute pattern moderates the dropout and ‘bottleneck’ scenario, but it may be questioned whether this pattern merely represents another face of the same dysfunction.

6.6.4 Heterogeneity and internal complexity

The large difference in completion and progression rates between academic and vocational students gives rise to an assumption that a large portion of the weakest candidates is found in the vocational training courses. In a similar vein, it can be assumed that several of the residual categories that formerly fell outside the system now typically find their way to vocational training programs. An implication of this assumption will then be a more complex core technology within vocational training, compared with the academic schooling area. Research reports have drawn the inference, due to the intake reforms of the 1990s that schoolteachers and managers of vocational training must deal with a more diverse and demanding student population.

The observations drawn from the first stage of the case study, based on a sample of five sites, uniformly confirm the image of a more heterogeneous student population along with increased internal complexity in the teachers’ work context. Whereas the observations made in academic subunits do not report substantial changes in student recruitment after the new intake regime was implemented, at least on average, the picture is converse in the vocational panel. The interviewees selected from vocational subunits describe that major changes have taken place in vocational training after the implementation of ‘Reform 1994’. As all students were granted the statutory right to enter upper secondary schooling in their local environment, an extended intake of students with a lower cognitive status, special needs and disabilities was the situation most teachers and school managers now had to face. Moreover, the interviewees describe that several students that formerly would have been excluded now entered vocational schooling in normal classes, a development leading to a more diverse and heterogeneous student group within each class. As one of the informants puts it:

Reform 94 caused a radically altered student-population in our classes, in terms of a more heterogeneous group of students, ranging from the theoretically strong ones, aspiring to higher education, to the students recruited by the special- intake. The latter category had increasingly special needs demanding tighter follow-up activities from the teachers. Because all kinds of students should be integrated into the same class, the teachers reported to me a series of complex and difficult work situations.
(Informant No 2, middle manager)

The descriptions brought up by the interviewee portray, thus, a more complex internal work technology due to a more heterogeneous student group in the classes. The interviews express a perception of several recurrent dilemmas and goal conflicts gradually evolving after the implementation of the reform. The descriptions do not argue against the reform goals or criticize the underlying policies. They rather express concerns associated with a more complex and demanding work situation, not least related to workplace training. This situation makes it difficult to escape problems of decreasing quality of deliveries, because the students will be faced with the challenges at the end of the chain, when they apply for apprenticeship in the local working life.

6.7 Revising the distributed training curriculum

6.7.1 Shared responsibility in a distributed model

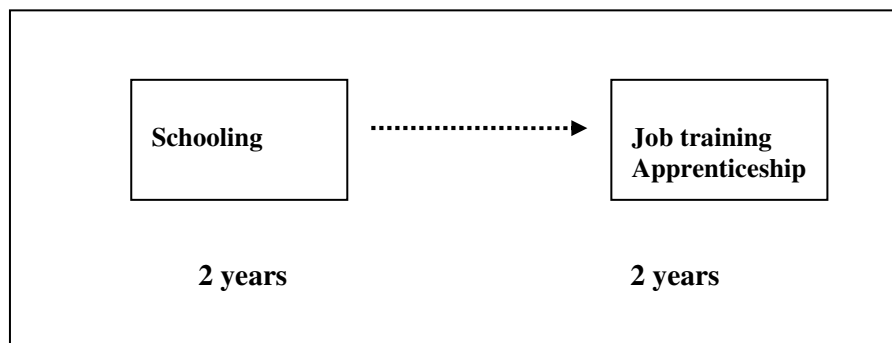
As briefly described, the curriculum framework of vocational training constitutes a standard model that governs most programs in Norway⁹⁵. As seen, the curriculum structure presumes a shared responsibility between a local vocational training school and the corresponding workplace organizations in the local working life. The label ‘corresponding’ denotes that both the line of schooling and the workplaces operate within the same craft domain. Because the training curriculum consists of two equally weighted sub-programs, the arrangement is labeled the ‘2+2 model’. The distributed training model presumes in itself that the schools and their working life environments share the responsibility for the completion of the students’ prioritized programs. However, there are no structural arrangements, and very few incentives, that may ensure and safeguard the

⁹⁵ It is in theory possible to gain craftsmanship through a small sample of 3-years in-school programs, but these count for only a small minority of students and ongoing training activities (Helland, 2006).

completion. The students apply for contract positions in an open market, and it is up to the individual workplace organization to assess and judge the standard of the applicants.

As such, seen from the schools' point of view, there is a relatively asymmetric power distribution inherent in the training model. In principle, students that start their four-year training program in an in-school foundation course bear the risk that they will not have the chance of fulfilling their program. Not necessarily because of lack of satisfactory grades and school achievements, but possibly due to lack of resources in the school's environments, or even lack of will to recruit apprenticeship applicants. The thesis sees this model as a distributed curriculum. The term distributed captures more properties than solely the shared responsibility between schools and workplaces. It is used to highlight the fact that each training program is grounded on a distributed pattern of complex and partly situated activities. The term denotes that the actors involved in the distributed training do their daily work within frames of reference that to some extent are divergent from each other. A simplified model of the training curriculum is illustrated in figure 6.2.

Figure 6.2: The distributed training curriculum



The interview descriptions specify a series of cases of cognitive distance related to demands on and expectations of students. Specifically, these convergent demands refer to standards of student behavior, level of motivation, work effort and perceptions of what is relevant knowledge for workers. The existence of cognitive distance among training partners is described as a function of more liberal behavioral rules in the current school regime, compared with what is normally demanded at the workplace. I argue

that it is important to capture this pattern, in order to understand the full complexity involved in the school-environment relationships. Accordingly, I use the term *distributed* to conceptualize important analytical aspects of this arrangement.

6.7.2 A didactical distribution

As illustrated by the model above, the training program is split between in-school instruction and workplace training, each of two years duration. The model implies, *firstly*, that student learning activities and instruction take place in dispersed social locations. This is also the case during the first part of the program within school. During the in-school period, students are gradually incubated into the workplace realities through scheduled periods of job training on a short-time basis. Students shift between workplace practices and in-school instruction. To some extent, the in-school courses are thus organized in a rotation pattern, where schoolteachers and managers are responsible for following up these short job-training sequences. *Secondly*, the training program is grounded on discrete activities undertaken in separated social locations. Discrete means that the activities are decoupled from each other in a structural sense. *Thirdly*, all the activities of the program involve different actors, teachers and workplace instructors, and these actors do their work in a fashion that is disconnected from the other. The properties of disperse, discrete and disconnected activities and actors underscore that the distribution mechanism is crucial for constructing a coherent learning chain for the students. This means that the didactical and pedagogical components are disconnected from each other, which requires some kind of integration mechanism at hand.

6.7.3 A social project

In a cross-sectional investigation, based on a sample of 783 apprentices, researchers have attempted to gain more insight into the students' motive structures, expectations and experiences of the acquisition process⁹⁶. The sample is unique, because its members have succeeded in overcoming this kind of labor market barrier, in terms of acquiring an apprenticeship contract. The most interesting observation is the indication of some social mechanisms, although on the surface, of how students are incubated into apprenticeship. The data set displays that 41.4% of the apprentices had

⁹⁶ Reported in Markussen and Sandberg (2005)

already been accepted by the apprenticeship workplace before they left the second year of schooling. The researchers collected their data during March and April, which means 2-3 months before the students left the school part of the training program, and at that point, 41.4% were already in a contractual relationship with a workplace. A Further 8.6% of the sample were in a position of working in (and later taking over) a family firm.

The data therefore indicates that apprenticeship may, at least to some extent, be seen as a socialization project, where the incubation during the school-part of the program plays a significant role. The data set relatively clearly implies that the in-school part of the program has an important function as an incubation and socialization mechanism that may enable the students to overcome the barrier. In other words, what happens during the first two years in school makes a difference. The socialization and incubation hypothesis is further strengthened in the same study. The researchers also collected data that measures the 783 apprentices' preferences and expectations of future job training before they left school. The respondents were asked about their attitudes and expectations to future job-training 2-3 months before leaving school. The highest scores are listed in table 6.6.

Table 6.6: Reported expectations of future apprenticeship

Indicator	Response
Expectation of good job satisfaction to be experienced at the workplace	96.5%
Expectation of proper training at the workplace	96.1%
Expect a good learning environment	95.5%
Expect to complete the apprenticeship contract	95.3%
Expect to meet good colleagues in the company	92.1%
Look forward to start as apprentice in the company	90.9%
	N = 783

Source: Markussen and Sandberg (2005,p. 54)

The data table indicates that successful students, capable of entering the inside of the workplaces, are characterized by positive expectations and attitudes to the future job training. They expect to be trained properly, to work collaboratively with experienced workers and to experience good job satisfaction in the work place. In other words, successful applicants are characterized by socially appropriate attitudes to the future work context. Although the evidence only constructs a tentative and suggestive image, it

gives rise to a hypothesis that this is more of a local socialization and situated learning project than estimated in prior research. If this assumption holds, one of the implications is more emphasis on socialization and incubation activities, alongside social network engagement with the working life counterpart.

6.7.4 Entry of apprenticeship - a predictor of labor market integration

The previous data set focuses only on the shift between leaving school and entering the workplace, in other words the interface between the discrete sub-programs of the *distributed curriculum*. This is, however, the critical phase in the distributed training program. Other data sources bring evidence that when vocational students succeed in achieving an entering position, i.e. apprenticeship contract, they have a fair chance of completing the whole training chain⁹⁷. In other words, when students have overcome the interface barrier between schooling and job training, they have a fair chance of achieving their final certificate. The shift is therefore the critical phase, and many students drop out of the program when not achieving the possibility of entering job training.

Jens B. Grøgaard's (2006) longitudinal study based on the 1994 student cohort also includes evidence of what happens after the students have received their craftsman's certificate; a result of 4 years combined schooling and job training. When he analyzes explanatory factors to strong labor market integration, the most significant explanation is the achievement of an apprenticeship position. Strong labor market integration is defined as being in a permanent and full-time job position within the same occupational domain for which he/she is educated and trained. For example, strong labor market integration for a student of information technology and electronics may be a full-time tenure position as a certified craftsman in a computer company. Two independent studies demonstrate that the critical step in a successful training chain is the entering phase⁹⁸. As a result, the larger inference points to the upside of incubating students effectively into the starting point of an apprenticeship contract. When students get into a position at the workplace, two upsides are discernable: They have a fair chance of completing the training program and receiving their certificate. In addition, they are also uniquely positioned for strong labor market

⁹⁷ See Helland and Støren (2004); Helland (2006)

⁹⁸ See Grøgaard (2006)

integration within the same occupational domain as they started their educational career in the foundation course.

6.7.5 An asymmetric curriculum

The thesis also argues that, seen from the school's point of view, several asymmetric relationships are embedded in the distributed curriculum. On one hand, the school is obliged to administer the student's statutory right to upper secondary education, in accordance with the legislation⁹⁹ and the political prioritizations of the regional authorities. Therefore, when the students attend a vocational training program, they naturally expect to fulfill the four-year training chain. Nevertheless, paradoxically, at least seen from the student's point of view, this guarantee itself does not ensure the fulfillment of the training program, simply because it is up to the local working life to assess and judge applicants concerning apprenticeship.

This situation reflects an *asymmetric* distribution of resources inherent in the distributed training model. The situation can also be understood as an asymmetric distribution of power. The workplace organizations may, in accordance with their own priorities, judgments and choices, decide the intake level of recruits. Furthermore, they are in the position to assess the quality of the candidates, and based on this body of perceptions and experiences, they may literally take in the candidates they prefer. Through the rotation system of students during the in-school part of the program, workplace institutions have close to perfect information about the behavior, progress and motivational standard of the candidates. The institutional arrangement inherent in the distributed curriculum implies per se an asymmetric relationship, simply because the school has to fulfill the formal rights of the students without structural tools and resources to realize the preconditions on their own.

The curriculum is therefore analytically seen as a stable case of external stakeholder dependency, where vocational schools are strongly dependent on their working life environments. Each subunit or knowledge domain is largely dependent on stakeholders in corresponding working life domains that typically impose technical demands on schooling. From a managerial viewpoint, it represents a major source of *dissonance*, where the structure and the educational rules do not provide any appropriate solution to fill the gaps inherent in the system. Consequently, the locus for solutions in problem solving is in the local environments. The crucial point is that

⁹⁹ The Norwegian Education Act of 1998

stakeholders have opinions and perception of the technical sides of instruction, but also that they are in a position of assessing the quality of the human outputs through their incubation and intake procedures.

6.7.6 A loosely coupled educational structure

Armed with evidence from different data sources, the analytical accounts of the distributed curriculum portray an extreme variant of a *loosely coupled* system. *Firstly*, the two building blocks of the training program are structurally separated, disconnected and socially and demographically dispersed. The various data sources, interviews and secondary documents, show that the sub-programs are organized in a disconnected fashion. The discrete parts of the training programs are, *secondly*, furthermore situated in different work contexts, which produce some incompatibilities in demands to student behavior. Informants particularly point to behavioral codes, work attitudes, absence and willingness to accept customer driven rules in a business organization. As the training elements are situated in different frames of reference and organizational logics, cognitive distance between actors also may be a side effect.

A *third* form of loose coupling is strikingly exposed by lack of a coherent information system at hand for school managers for tracking the career paths of the students. As a result, when the researcher aims to collect data about this topic, there is no coherent information system to be found. When interviewees are asked for formal information routines about their former students, in order to monitor their subsequent efforts in the training chain, the data is silent. At the micro level, middle managers and teachers keep informal track of their classes, but there is no coherent system at the school level. The responsibility is split between school and civil services after the second year, which represents a category of loose coupling.

A *fourth* category is the inherent situation where the school has to face the responsibility for fulfilling the students' formal right to education, whereas the actual decisions and resources are found in the external working life environments. The case, as such, represents an extreme form of separation of means from ends. A *fifth* category is represented by vague and over-general rules and organizational routines, when it comes to the problems and gaps described previously. The routines do not provide any toolbox of appropriate solutions and leave adaptive actions to the local level of middle managers and schoolteachers within each occupational domain. A brief overview of the loose coupling inherent in the distributed curriculum is shown in table 6.7.

Table 6.7: Loose coupling embedded in the distributed curriculum

Category of loose coupling	Description
Structural disconnection between provider units	In-school instruction structurally decoupled from workplace training. When students leave school, they are rooted into civil service apparatus and branch offices in the application process
Cognitive distance between provider units	School instruction and workplace training situated in different contexts, frames of references and organizational logics
Lack of information system	Critical information is divided on different levels of the educational system, but no coherent information system is available
Guarantee instrument decoupled from apprenticeship decision	The school has to face and manage the guarantee instrument, whereas actual decisions of throughput and completion are made on the outside: Endogenous responsibility and exogenous decisions
Vague and over-general rules	Rules and organizational routines do not offer concrete and specific solutions to the bottleneck problem
Gaps in available resources	Lack of apprenticeship positions

The account of loose coupling summarizes a series of dissonance situations that can be expected to occur and reoccur in vocational training. *Dissonance* denotes that gaps, mismatches and recurrent problems are not solved by the available pool of repertoires in the organizational structure. As will be elaborated in the subsequent chapters, critical information is acquired, processed, stored and retrieved in social network settings and informal practice communities. This pattern co-exists with adaptive efforts, informal learning contexts and boundary spanning activities at the local level of the school.

6.8 Summary

The various data sources are collected, retrieved and analyzed in order to capture the nature of the external environments, by which vocational training institutions are surrounded. Large-scale data is paired with policy review work and primary observations, actor interviews and secondary data, drawn from the initial case study of five sites. The available evidence uniformly points to the inference that vocational training emerges as divergent educational contexts, at least compared with academic schooling. The differences are primarily manifested in the curriculum structure, but also in the range of technical challenges resulting from the inclusive intake regulations of 'Reform 1994'. The quality problems of study progression and dropout are most severe within the vocational training field. The dropout problem takes the form of a bottleneck problem, in terms of lack of apprenticeship acceptance, in many cases. At the same time, the extended version of the inclusive school doctrines that have dominated the reforms of the 1990s may be expected to show social influence. Actor interviews and secondary documents for example, expose an inclusive local intake policy, which amplifies the complexity. Vocational training institutions must therefore take into account two streams of external demands, from the external working life as well as the policy environments. The thesis assumes that adaptation is a complex enterprise that boils down to a balancing act of managing inclusiveness and adaptability simultaneously.

Various forms of *dissonance* that must be dealt with at the local level of the school simply because the curriculum structure is internally disconnected and the overall rules do not provide solutions for recurrent problems thus, characterize the field. Sources of dissonance are manifest in strong stakeholder dependency that is technical in nature, asymmetric distribution of information, resources and power, cognitive distance between actors and an extremely complex core technology in the classrooms. The curriculum represents an extreme case of loose coupling, and the only rational response pattern seems to be found at the local level of the school, as posed by the informants. Local adaptation, in terms of external interactions, boundary spanning activities, participation in occupational networks and other forms of informal innovations then emerge as the most rational strategy for dealing with domain specific and technical adaptation problems.

Chapter 7: Descriptive narrative of the Alpha case

7.1 Introduction

The analysis of chapter six concluded that vocational training schools are confronted with a continuous stream of technical challenges imposed from their environments. Furthermore, these demands from local working life fields are added to institutionalized commitments and obligations to normative and cultural pillars of the larger unified school institution. In consequence, adaptation is assumed to shape a balancing act between technical adaptability and social obligations. Moreover, in accordance with the loosely coupled perspective, adaptive learning systems are grounded on the micro level of the school organization. This chapter therefore shifts the level of analysis from macro to micro through presenting evidence about the response strategies employed by actors at the micro level of the school.

The purpose of the chapter is, thus, to present the descriptive data from the first of two sub-cases investigated in depth. The site is anonymously labeled Alpha. Case findings are set out in a descriptive fashion, in order to prepare the ground for the subsequent analytical construction process. The logic of this analytical tactic presumes that “elaborating descriptions is not theory in itself, but rather basic to theorizing” (Strauss & Corbin, 1998, p. 19). Following this line of argument, the descriptive narratives found in the data play an important role for the subsequent conceptual ordering of the material, as well as for the identification of commonalities and differences. As underscored by Corbin and Strauss (1998), “it is important to understand that description is the basis for more abstract interpretation of data and theory development” (ibid, p. 18).

The investigation has focused upon how stable contingencies and constraints are understood, interpreted and responded to at the operating level of the school. Especially, stable dissonances arising from the statutory right regime and the distributed training curriculum have received attention to during the data collection process. Nevertheless, the main body of descriptive data refers to the response strategies employed by school managers and teachers, in order to pursue local adaptability. Three major adaptive learning instruments emerge from the descriptive data. *Firstly*, the redesign of the school towards an empowered team based structure emerges as an important enabling condition, in order to make small-step adjustments close to action. *Secondly*, this pattern co-exists with increasing and intense engagements in occupation-based social networks. *Thirdly*, changes and extensions in the middle manager’s work role emerge as a decisive adaptive component.

These three features are key components in the descriptive accounts presented. Descriptive data of these broad themes are paired with descriptions of the basic profiles, school structure, work and dominant institutional norms of the research site.

7.2 Basic profile

Alpha is a 55-year-old vocational training school located in an urban community in the eastern part of Norway. In the local environments of the school, a range of public institutions is found: Municipality administration, county administration, state civil service agencies, regional court administration and a state owned university-college. Together with a range of production companies and service providers, these institutions form a diversified working life environment as target for the training programs of the school. The Alpha site offers a series of foundation courses ranging from Mechanical trades, Building & construction trades and Electrical trades to Computer electronics. Added to these typically technical and industrially oriented training programs, aesthetic oriented subjects and a foundation course in Arts, crafts & design are offered.

Following completion of the foundation course, the students may choose among twelve advanced courses. When the candidates have completed their advanced course, i.e. after their second year in school, they normally apply for apprenticeship in a workplace in the school's local working life environment. Over time, the school has established and maintained a series of collaborative partnerships in the local working life, in order to facilitate and support the students in their careers towards apprenticeship. In addition to programs that qualify for job training, Alpha offers two advanced three-year programs that qualify students for application to higher education studies. This means that students at the Alpha site can choose whether they will seek apprenticeship positions in working life, and thereby qualify for a craftsman's certificate, or apply for poly-technical studies after their third year in school. The total number of enrolled students is about 800, with a teaching staff of 90 in approximately full positions.

7.3 Dominant norms

Approximately 20 % of the students at Alpha are selected through a special intake for candidates with special needs for tailored education. The relatively high rate of special intake students is partly a function of the intake

regulations arising from the reform in 1994, simply because the applicants have the right to be offered one out of their top three priorities. However, as consistently exposed during the interviews, the high special intake portion is also described as a function of longstanding norms of the school community. In practical terms, the rate of students taken in from the lower categories is determined from year to year negotiations between the civil service and the school management. It is, as such, a case of deliberate school policy. As a former principal of the school describes it:

Our school policy reflects a deliberate strategy, where we try to find an optimal balance of students recruited from the special intake regulation. We want the school to be open for students from all kinds of social backgrounds, but at the same time, the number of special intake students must be absorbable and manageable for the school society.
(Informant No 12, former principal)

Similar descriptions are replicated across the entire sample of actor interviews drawn from the site: The demanding intake of recruits with special needs reflects a deliberate school policy rooted in well-established attitudes and professional norms among school managers as well as the teacher corps. On one hand, being an open and inclusive school for all kind of students emerges as a well-anchored strong institutional norm among both the teachers and the management corps. On the other hand, the school-based intake policy reflects a strategic balancing act of inclusiveness and manageability. Due to this deliberate policy, the management core of Alpha has prioritized the allocation of an above-average level of human resources on special education and social pedagogy services. Resources are allocated into a stable pool of special education teachers, teacher assistants and follow-up services, which are managed by a special coordinator in the central office of the school.

7.4 School structure

Five functional subject departments that approximately correspond with the occupational domains, into which the school aims to train and socialize their recruits, structure the Alpha site. All departments are headed by a middle manager, who also serves duty as teacher in a minor part of the position. The line structure also includes a *contact teacher* function, aiming to strengthen the coupling between the management core and the students within each of the departments. Each contact teacher is responsible for a group of 15

students. Teachers in academic subjects are subordinated into the vocational subunits. This deliberate choice was made in the early 1990s, in order to ensure a satisfactory fit between academic and occupational knowledge in the teachers' practical instruction. The whole department structure was re-designed with the purpose of stimulating teachers in academic subjects to adapt their instruction closer to the didactical conditions of the vocational specializations. A former department of general academics was closed and the teachers were transferred into pure vocational subject departments.

7.4.1 The team-based design

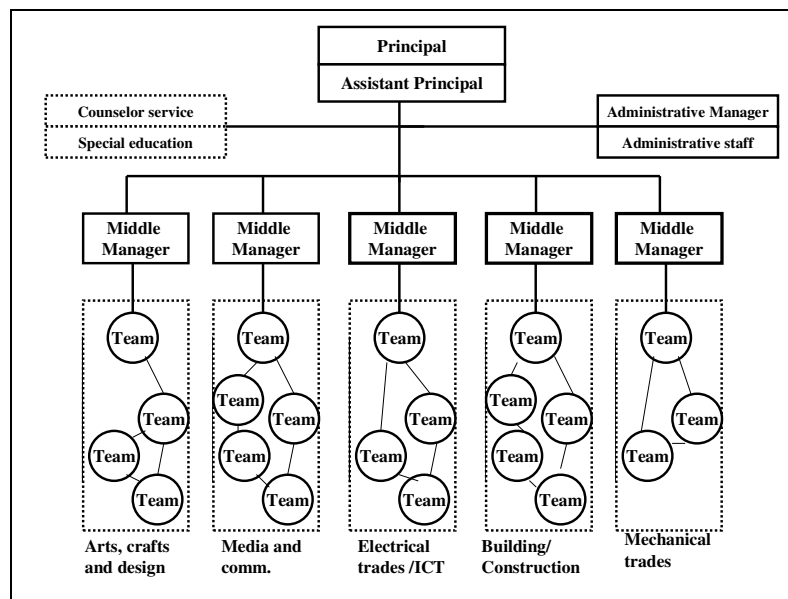
At the end of the 1990s, a major restructuring of the subject departments was launched¹⁰⁰. The motives, as emerge from the descriptions, arose from the perceived need to better master a more heterogeneous student population, due the changed intake regulations as well as to the fact that the school maintained their inclusive policy. The key component of the restructure was the introduction of a team-layer in the operating core of the school design. In practical terms, each of the subject departments was fragmented into five or six teams. More importantly, the teacher team became a clearly specified unit in the school's formal structure, anchored in the teachers' tariff agreement. Each teacher thereby became coupled to a team, and to the students. The purpose was to create a collaborative teacher context close to the work of the students.

The core team, which is the official label, is a formal work group of teachers designed to take responsibility for a defined number of classes and students. Membership and participation are compulsory, and besides, the teamwork is to some extent self-governing. This means that teams have certain degrees of freedom to make instructional decisions in accordance with the members' joint priorities. The core teams may for example design individual programs for students in accordance with their professional judgments. Teams are furthermore empowered to make decisions in time-planning issues, preferred curricula components, project work and prioritizations of instructional materials. The decisive point is, thus, that the core team possesses significant degrees of freedom and local autonomy in order to construct and adjust a defined set of frameworks and local routines that govern the individual team members' work in the classroom.

¹⁰⁰ The restructuring process is laid out more in detail in subchapter 7.6

The underlying rationale is, as such, *firstly* to enable relatively rapid didactical adjustments when needed. *Secondly*, the team structure knits the teachers that share a technical domain, i.e. a number of classes and students, closer to each other. *Thirdly*, this close-knit structure is anchored in objectives of creating a collaborative context that may help the individual teacher to better master complexities in the daily work. As such, the teams were induced to the department structure in order to create a ‘supportive belt’ round a more complex context of instruction. Coupling mechanisms are co-location and clearly defined responsibilities. Seen from a line management point of view, the governance line is drawn from the middle manager to a group of core teams. The functional structure, after the implementation of a core team layer, is illustrated by figure 7.1.

Figure 7.1: The team-based functional design of Alpha



According to the descriptions, the department as a functional unit has also gradually changed its mission towards a context for diffusion of information and experience *between* teacher teams. Important issues related to coordination, planning and short-term decision-making have been delegated to the team-layer, which changes the nature of the subunit. As one of the middle managers puts it:

After the implementation of the team structure, the nature of the subject department meetings gradually changed towards an arena for sharing experiences. The conflict level of department meetings also decreased, because many issues were already resolved when the meeting was set.

(Informant No 2, middle manager, second interview)

However, this construction of a team layer within the subject department has also formed a more complex organization to manage from the middle level: On one hand, the middle manager is the superior for a group of individual subordinates in a line management structure. On the other hand, the middle manager also has to support, lead and manage a small collection of core teams within his or her subject department. From this perspective, the middle manager's job is 'double knitted': On top of the line management duties, he or she is required to support and facilitate a series of within-team processes. Besides, diffusion of knowledge and information between them also becomes an important task. Consistently arising from the interviews is the description of a radically more complex work technology to manage. On the upside, as described by the interviewees, the team-based subject department provides more opportunities for dealing more effectively with more demanding interactions involved in teaching.

7.4.2 The leadership core

The line structure displays a small apex at the top of the school hierarchy, where the school principal is a full-time manager with overall responsibilities for the school's operations. The principal is empowered to undertake negotiations with trade unions on behalf of the regional county. There is, as such, a civil servant element included in the principal role, because he/she is a subordinate of the county administration. The associate principal is in a number-two position in the school hierarchy and the principal's substitute in the event of the principal's absence. The apex also includes an administrative manager responsible for personnel planning and administrative tasks. An office deputy manages the mercantile staff unit, and the staff is responsible for accounting routines, official statements and financial reports. Tasks and responsibilities of each management role are specified in table 7.1.

Table 7.1: Responsibilities of the school managers

POSITION	MAJOR TASKS AND RESPONSIBILITIES
Principal	Strategic planning, external relationship, follow up of middle managers, reporting to board and civil service
Associate principal	Overall planning, instructional routines, quality assurance systems, student assessment, and student related issues
Administrative manager	Human resource management including vacancies, pensions, turnover, staff recruitment
Middle manager	Head of department, management of department staff, educational planning, budget control, workplace relationships
Office deputy	Budgeting, accounting routines, financial reporting

The interviews with the management actors, both at the top and in the middle line, display a strong rhetoric of team behavior and team philosophy inherent in the work routine of the school management group. Based solely on interviews and secondary documents, it is not easy to distinguish between artifacts and realities in terms of implemented practice. However, one area of their practices in particular is consistently exposed during the interviews. The participants underscore the importance of the management team meetings to create shared understandings and conceptions. For example, one weekly meeting is reserved for thorough discussion of reform concepts, the way regulations are to be understood, what the content of pedagogical principles is, and how organizational routines are to be practiced across the school territory. The principal puts it this way:

We spend a lot of time on discussion and dialogue in the school management group. I have established a weekly meeting with this objective, aiming to establish common and widely shared understandings of important concepts. Similarly, through dialogue and discussion among the members, we work towards a gradually shared understanding of how rules are to be practiced across the school.

(Informant No 8, principal, first interview)

The participants argue for the importance of working towards shared conceptions and understandings, where rules are practiced in a relatively convergent manner. This particularly concerns rules that govern teacher behavior and expectations and demands to student behavior. The accounts

emerging from the interviews are significantly supported by secondary evidence, such as written agendas, minutes of meetings and protocols.

7.5 External demands, constraints and contingencies

Two interrelated themes concerning external demands and environmental contingencies consistently emerged during the interviews. The *first* refers to the impacts on classroom instruction from the new intake regime established after 1994. The informants describe radically increased complexity in classroom work, due to a more heterogeneous student setting. The *second* theme addresses changed external relationships to the working life. Recurrent challenges are associated with the distributed training model, and the actors describe a situation of increased dependency on the external stakeholders in the workplaces.

7.5.1 Heterogeneity and complex interactions

The sample of informants was asked about their perceptions of the teachers' work context in the classes, and they all portray a pattern of changes gradually evolving after 1994. Three observations are relatively consistent throughout the sample. *Firstly*, the school managers report a more diverse population of students in the classes, due to the intake regime of the reform. According to the descriptions, increased within-class heterogeneity is manifested in variation in the students' cognitive capacity, as well as in their motivational status and work behavior. In particular, the increasing share of students with low cognitive status co-exists with significant increases in the demand for special education and individually tailored instruction plans. *Secondly*, the interviews take up and explicate various quality problems related to this situation: Less motivated students and increasing problems with short-time absence, dropout and delayed study progression, alongside a frequent stream of instructional problems. A *third* topic refers to a more complex and demanding work context for the teachers, because more special education services and follow up tasks have to be integrated with ordinary teaching. As one of the middle managers put it:

Because all kinds of students were integrated into the same class, the teachers consistently reported to me about a series of complex and difficult work situations. The performance appraisals with my teachers increasingly addressed decreasing job-satisfaction due to a more demanding student group.

(Informant No 2, middle manager, first interview)

The interviewees also described a more complex pattern of interaction involved in teaching. Complexity in interactions refers to an emerging stream of situations where teachers need to employ a more diverse didactical repertoire, in order to meet the needs, at least at a minimum level, of a more diverse student group. However, complexity in interactions also refers to more interactions with the internal special education task force, the follow up services and the diagnosis apparatus of the municipalities. An ever-increasing number of tasks need to be coordinated with other personnel groups more frequently, and, in a similar vein, 'first-aid solutions' often have to be created on the spot. The main image, thus, coheres round the image of a more internally complex work context due to the statutory right regime. Internal complexity, furthermore, co-exists with a stable stream of mismatches and gaps, manifested in decreasing job-satisfaction, student dropout, problems with temporal absence and decreasing student achievement.

7.5.2 External dependency

Added to a more challenging work context in the classrooms, recurrent mismatches regarding working life demands was also a major theme during the interviews. This was especially the case among informants drawn from the technical-industrial segment of the sample. As stated by these participants, the target workplace institutions surrounding the school operate in competitive and knowledge intensive environments, and therefore, do not have very much tolerance for lack of skills, work efforts or motivation among the recruits. The mission of their lines of schooling is, thus, to deliver recruits who are capable of meeting appropriate standards of attitudes, knowledge and skills demanded by the workplaces. However, these standards are defined in the environments of the school, i.e. in the workplaces, which creates a situation of strong external dependency. The interviewees, express a recurrent goal conflict between inclusiveness and being capable of meeting working life demands. This enduring dilemma is described as follows:

The official policy says that we should be an inclusive school for all. But the working life in businesses does not want to recruit all kind of students, unless they match the needs and expectations of the businesses. This is not politically correct to say, but the dilemma reflects the reality we on a daily basis have to face as a vocational training institution for business life. Businesses and industries are the most important stakeholders for our schooling and training. And if their satisfaction with the students we send to the workplace decreases, we face real problems.

(Informant No 5, middle manager)

The middle managers of the technical-industrial lines in particular describe a situation radically increased external dependency on the workplaces. At the same time, the interviews concern a more challenging context for adapting student capabilities to workplace expectations, due to greater within-class differences in the students' abilities and motivational status. These situations are perceived as inherent goal conflicts, and it is difficult to 'escape' from them in practice. Recurrent situations in contrast, are perceived as gaps, challenges or mismatches that must be dealt with through proactive action strategies. Teachers and school managers have to invest radically more energy and efforts in adaptive strategies, in order to satisfy the needs from the workplace, and, at the same time, deal with a more diverse and challenging student setting. The richness of details varies across the interview sample, and some interviewees are more analytically oriented than others are in their accounts. Nevertheless, the main evidence coheres round a notion of dissonances that must be continuously handled.

7.6 Restructure as adaptive response

The interviews and secondary data provide rich descriptions of the major restructuring initiated from 2001, where the core teams were induced into the subject departments. The initiative focused upon perceived needs for improvements in the technical organization of teaching, in order to respond more effectively to reoccurring challenges that had shown a stable pattern over years. The motivational drivers were growing perceptions of dissonance among the school managers. Since this emerging perception of the school's situation was increasingly shared among teacher groups, a relatively strong coalition emerged. The restructuring process induced a distinct new form element, and team participation became compulsory, formally anchored in the tariff agreement of each teacher from the early beginning. However, the restructuring process also prepared the ground for

the building of a new methodology in terms of a team based local routine, rooted in a well-defined distribution of authorities and responsibilities between the hierarchy and the teams. New emerging tools and frameworks that guide both the teamwork and individual teaching were developed and gradually situated into the work context of teaching.

7.6.1 Launching a change project

A change project was initiated in 2001, highly prioritized from the management core, and additional resources were allocated, in order to gear the project activities. The core motivation factor was the recurrent mismatch between the traditional mode of organizing the teachers' work and the perceived future needs associated with a more complex work context. I analyzed all available secondary documents from the change process during the preparation for the interview sessions, and a selection of topics from the documents was presented and focused on in the interviews. Although the project documents were overlain with strong rhetoric of 'differentiation' and 'student adaptation', the essence of the change project was the restructuring of the operating organization of the school. Key actors within the art, crafts and design subject departments launched the project proposal. They created the proposal based on their own perceptions of recurrent gaps in the existing technology, but also based on information and performance feedback transmitted through other channels. The change process, thus, departed from a 'reform center' at the local level of the organization, close to action, where the change agents had premium access to knowledge and critical information. Furthermore, this closely-knit group of teachers and their department head found strong political support from the top of the school hierarchy.

7.6.2 Search in response to mismatches

The project started with search activities in the environments for appropriate solutions that could be translated and implemented into the local work context. During the search process, there was a clear perception of a need to create a permanent team-based collaborative context close to action of the students. The second search criterion was the need for a didactical model that allowed level-differentiation in teaching and student work, in order to provide appropriate solutions for the lowest performing group within the classes. A third criterion was the need for significant delegation of authority

to a collaborative team layer. This issue collided with the complex system of tariff agreements and formal regulations of the teacher's yearly work duties. After some time, a preferred solution, which initiated a school-wide decision making process, was proposed. The approved solution implied a structural change of the school design, the decentralization of authority, a higher degree of freedom to the subunit level as well as altering educational planning routines and introducing a didactical model based on differentiation in instruction. The elements of the reform proposal are presented in table 7.2 below.

Table 7.2: The components of the restructure

Partial solution	Source	Description
Team layer in the subject department	Swedish gymnasium Danish technical school	<ul style="list-style-type: none"> • A design for closer-knit teacher collaboration and flexible organizing • Tight couplings between students and teams
An interval-model for organizing the school year	Danish technical school Danish gymnasium	<ul style="list-style-type: none"> • A revised total planning design: The school year is split into two intervals of equal duration. One half is in principle decoupled • Responsibility for time-planning is shared between the central office, the department and the team-layer
Level-differentiation	Danish technical school Local environment	<ul style="list-style-type: none"> • Level differentiation and tailored programs within fixed periods • Based on moderate streaming and level-differentiation
Team empowerment	Swedish private gymnasium	<ul style="list-style-type: none"> • Teams given responsibility for the management of its members' work contracts • Teachers' work contracts managed as a joint pool of resources

Each of the components, i.e. partial solutions, were outcomes of incremental processes of search in the environment, selection, translation to the local context, testing, modifying and re-modifying until an acceptable prototype was reached. The four partial solutions; team technology, interval planning, level differentiation and decoupling from the central planning structure, were then assembled and combined into a team practice. The descriptions of the

interview data underscore that each element of the model was not adopted in its raw form, but translated and modified. When a component was classified as potentially interesting, it was modified and tested in a limited context. Limited context means testing the model in a class or two within a limited time interval. Perceptions of how it worked in practice were then used to modify the partial solution.

7.6.3 Transforming the operating core

When the decision making process had reached a solution ready for implementation, the level of conflict among the teachers increased. Some of the teachers felt insecure about their formal position and working conditions, and coupled the trade union into the process with the purpose of canceling or postponing the changes. During these clashes, the middle manager utilized the top of the school hierarchy and the civil service bureaucracy as a reservoir of political support, and besides, the performance appraisals and department meetings were used as an opportunity to map the political terrain and space for maneuvers. These events were described as important in entering the 'from idea-to-practice' phase. To implement the preferred changes in the core technology, a deliberate strategy of incremental implementation and diffusion was chosen. In the first school year of implementation, the new technology was only introduced in the half of the split foundation classes. Thereafter, the new technology 'followed the students', so to speak, which established tight couplings across classes and levels. When the students continued with their first advanced course, the teachers had to maintain the team based practice, whether they liked it or not. The whole core technology of the school was changed over 3-4 years.

7.7 Growth in network engagements

The case study also provides rich and detailed descriptive accounts of a relatively stable and intense pattern of collaboration among schoolteachers, middle managers, workplace instructors and their managers. The interactions are of a boundary spanning nature, simply because they are grounded on collaboration that crosses the external school boundaries. They also form a recursive pattern, because workplace employees engage in activities within the subject department, and vice versa. The locus of interaction is the respective knowledge domain. For example, teachers and the middle managers of the IT & Electronic department form their professional ties, and

engage in joint activities, with actors of the IT workplaces. The data thus identifies a “prototypical” pattern, a model-case, of collaborative interactions that takes place between each subject knowledge domain and their corresponding workplace environments. The data exposes variation across the subject departments in frequency and scope of activities, but the prototypical pattern of social interactions itself is identified across all subunits.

7.7.1 Network formation within occupational domains

The identified pattern of interactions is activated through social and personal ties between actors within each occupational domain: Schoolteachers, their department heads, i.e. the middle manager, a range of workplace instructors and managers of these workplaces. The actors all work in disperse locations, but they connect with each other on a regular basis. They perceive these collaborative patterns as important mechanisms for the school’s mission in socializing their recruits into apprenticeship, as exposed by one of the informants:

Our teachers need to know exactly what is going on in the workplace, because the students only acquire some minimum basic competence in school. Our teachers must therefore be skilled and knowledgeable far beyond what is required to fulfill the preconditions in the curricula and beyond the formal expectations of a teacher. Therefore, we arrange a series of common meeting places and joint competence arrangements for workers and teachers, and these activities have over time contributed to a common ground for understanding, both workplace and schooling. Because both teachers and workers are also involved in instruction of the same group of students, and they meet each other regularly, they share understandings of student needs and pedagogical tools required for recruits in our days.

(Informant No 6, middle manager, second interview)

As stated, the purpose of these crossover interactions is primarily to improve the conditions for the incubation of students into apprenticeship. The objectives are sought to be accomplished through a range of shared activities: Workplace specialists are included in recruitment activities, all aiming at increasing the motivation among students to work in industries. Regular meetings between schoolteachers and working life instructors are held in order to promote a shared view and understanding of what are crucial requirements in the training of students. Seen from the school’s point of view, the collaboration is a way of acquiring large amounts of additional

core competence, yet more importantly, it may improve the probability of students achieving an apprenticeship position, and subsequently master the demands of the workplace. Seen from the position of the workplace, the outcome of this network based on collaboration, first is an improved recruitment basis. Moreover, due to a more intense model of collaboration, workplace representatives are better positioned to exert direct influence on how students are prepared for entering the workplaces. At the end, the collaboration may result in a close fit between what is taught in school and what is expected in the workplace.

Although the data is silent about perceptions of this construction among workplace actors, the accounts expose stable opportunities for working life actors to exert influence on in-school teaching. When business instructors engage in joint activities with school professionals, they may per se exert influence on the preconditions of their own recruitment. In addition, the business firms and other workplace institutions have the opportunity to exploit the schools as resource centers, where the competence of their workers can be updated, refined and certified. Another account of firm benefits is joint courses and learning activities, where companies and subject departments in school merge their resources, in order to update competence effectively on both sides of the school boundaries. In addition, through the exchange of information, knowledge and resources, embedded in courses, practical arrangements and meeting places, tighter couplings between school subunits and their working life counterparts are knit.

The nature of the collaborative pattern corresponds fairly well with a social network grounded on distinct occupational boundaries. It is furthermore a local and close distance network, and the relationships, i.e. the ties, emerge as strong, which means that they are based on frequent interactions. *Firstly*, the players meet regularly, and frequent interactions are shaped through a range of professional forums and informal meeting places. Local branch associations and trade unions play a supportive role in this network, because they connect network players with each other through membership mechanisms. *Secondly*, the social context is close and local, simply because the pattern of interaction is restricted to a specific geographical location. *Thirdly*, the network is characterized by a high degree of density, because the actors collaborate on many enterprises, many 'things'.

Fourthly, the joint activities are of a recycling nature, in terms of repetitive activities, projects and discourses. This aspect is important from the perspective of building a practice repertoire grounded on network ties. A *fifth* important characteristic of the network identified, is its professional nature in an occupational sense. Interactions, social ties and cultural identities are grounded on a joint vocational core competence that is shared

among both school actors and specialist workers in the business. Moreover, most of the actors have gone through the same path of socialization, and they are part of some components of the same local 'history', simply because many of them have been former colleagues in business life.

7.7.2 Motivational drivers

The interviewees were all asked about the motives for engaging in this network construction. One set of motivational drivers, *firstly*, clusters round mutual learning benefits experienced over years. The school itself perceives a radically improved incubation and training context for students, and partner firms are positioned to use the school actively in development of the competence and formal certification of their workers. *Secondly*, for both parties, several additional slack resources have been made available in this way, in terms of knowledge and expertise, as well as externally funded projects. The first motive category for engagements in this collaboration and network construction is thus rationally constituted; rooted in common perceptions of valuable outcomes for all parties. As stated:

The collaboration with the business trades has been extremely valuable for both parties. This pattern has resulted in a substantial increase in the teachers' competence. For example, our teachers participate in post-training together with specialist workers from the firms within our business. These courses are jointly staffed by the subject department and the branch office for training where the latter has offered additional resources. For example, I teach theoretical subjects, and we apply these issues to practical segments. In these courses, workers experience that theory is useful, and that theoretical concepts fit well with practical challenges in the workplace. It is interesting, because practitioners often have pre-imaginings that theory does not fit in practice. My job is to organize all this stuff, in order to construct a common ground for both workers and teachers.

(Informant No 6, middle manager, first interview)

A *third* motivational component is a perception of interdependency and shared identity among the players within each occupational field. The point is to some extent self-evident, because many of the teachers and workers are recruited from the same occupational milieu. The interviewees, thus, express a sense of belonging to a unique competence field. An analytical point is that neither workplace employees nor teachers are pushed to such engagements by structural obligations. They seem more motivated by collegial initiatives and shared sense of what is needed for improving the

conditions for vocational training and socialization of future workers. The data also lends support to the important role played by middle managers. In a formal sense they are responsible for formation and maintenance of connections with the working life environments and in this respect, connectivity results from formal obligations. Nevertheless, descriptions also tell about personal and complementary ties held by middle managers, for example to associative forums.

7.7.3 Interconnections across boundaries

The data describes the occupational network and the core team as two integrative components that together enable a tighter coupling between the teachers' instructional work closer to workplace realities. *Firstly*, the relatively autonomous team layer in the school organization also enables the middle managers to link actual workplace partners more directly to the group of teachers that are collectively responsible for the students' total training program. Consequently, the descriptive accounts point to two distinct tools at hand in the endeavors of adapting to workplace demands: *Firstly*, a relative autonomous team context, where adjustments may be made relatively rapidly. *Secondly*, an occupation-based and strong network that unites school actors with their working life colleagues ensures a rapid flow of relevant feedback where the first brings this information to a context where it is possible to do something about problems. Accordingly, both components are important building blocks in a professional learning system that spans the school-workplace boundaries. As stated:

The collaboration with the business branch is a precondition for the schooling and training we offer in our lines of education. If this pattern is not at hand, the whole educational specialization will not work in practice. The introduction of the team structure has made it easier to set out signals from the workplace in practice, because a committed collaborative context now exists. In addition, the frequent informal and personal contacts between teachers and workplace instructors are valuable instruments.

(Informant No 4, middle manager)

The point of inference is that *both* the social network ties and a team based work technology are adaptive instruments this matter. These two structural elements enable the binding of discrete activities together across the external school boundary.

7.8 Perceived outcomes

A central theme of the investigation has been to explore possible outcomes arising from the teamwork as well as in from the occupation-based network engagements. The accounts emerging from the interviews and secondary data expose two distinct practices, i.e. local educational routines grounded on these interactions. The first type of practice has its locus in the work of the core teams, whereas the second emerges from the interactions among network participants.

7.8.1 The team practice

The essential property of the team practice is a sub-routine of interval planning that allows the teams to decouple a large portion of their work from the centralized timetable when needed. This local routine counts for approximately half of the school year, and it is performed in order to differentiate teaching to the various levels of the students' capabilities. The practice itself represents a case of decoupling from the relatively rigid conventional routine that surrounds both human resource management and instructional organization in Norwegian schools, and the practice is specified in table 7.3.

Table 7.3: The team practice

PRACTICE ELEMENT	EMPIRICAL DESCRIPTIONS
Adjusting instruction to levels and shifting demands	<ul style="list-style-type: none"> • Individualizing of curricula and plans for students with special needs • Level-differentiation of instructional provisions • Tailored in-depth work periods
Student involvement	<ul style="list-style-type: none"> • Student appraisal • Student participation in planning – indirect representation • Informal contacts due to sharing the same physical resources and locations
Interval technology	<ul style="list-style-type: none"> • Decoupling instruction periods¹⁰¹ from the central time-table • Intervals of fixed instruction, project work, integrated theme instruction and level-differentiated programs
Incubation and workplace socialization	<ul style="list-style-type: none"> • Gradually incubating students to a workplace organization through the praxis rotation • Agendas more focused on motivational and behavioral sides of the future apprentice job situation
Integration of workplace demands	<ul style="list-style-type: none"> • Workplace demands continuously on the agenda of the teams

In most subject domains, the teams are empowered to de-couple their work in 19 out of 38 weeks of the school year. Within these periods, the teams have degrees of freedom to make instructional decisions in accordance with performance feedback, own judgments and priorities. Tight coupling to the students is emphasized: Students are informed that they belong to a team of teachers, and they are included in joint arrangements early in the school year. Instead of meeting only a contact teacher, they now are coupled directly to the crew of teachers responsible for the main portion of the instruction. In addition, participative arrangements that ensure some degree of student feedback have been established. Student appraisal and student representation in formal meetings with team coordinators and the middle manager are mechanisms set up in order to establish a closer contact with the

¹⁰¹ A periodic school year technology of 19 weeks centralized planned instruction and 19 weeks of decoupled practice.

students. As their classrooms are located in the same landscape as the team members have their working places, enabling conditions for informal communication between students and their teachers are in place.

7.8.2 Shared practice across school-working life boundaries

The case data describes several joint activities that involve workplace firm employees, school managers and teachers. As seen, these enterprises encompass competence-building projects grounded on common interests and perceived needs for raising the competence on both sides of the school boundary. Through the efforts of creating joint courses for workplace employees and schoolteachers, a commonly owned stock of knowledge may be created, which may enable shared understandings to evolve and mature. In many of the cases described by interviewees, the middle manager has played a decisive proactive role in creating such arenas.

When asking for the underlying motives for such efforts, the interviewees describe a dual motive structure: *Firstly*, joint courses are created for raising the standard of both workers and teachers. *Secondly*, it is argued that by sharing a learning context and learning resources, a shared sense of how schooling and teaching of recruits can be improved, may be constructed. The data exposes that unique projects are established when partner firms use the Alpha site as a certification agency for their workers. The workers of the firms then go to school for short intensive periods in order to update competence and have their competence assessed and certified. A nested source of joint enterprises comes from externally funded projects. For example, one of the motor vehicle import agencies, Toyota Norway, selected Alpha as provider to train their garage workers in computer electronics and ventilation systems. Included in the contract was the option of arranging joint courses available for schoolteachers and fellow specialists in the garages. Such projects bring density and strong linkages to the professional network engagements. A brief summary of the network practice is presented in table 7.4.

Table 7.4: The network practice

PRACTICE ELEMENT	EMPIRICAL DESCRIPTIONS
Joint courses and projects	<ul style="list-style-type: none"> • Creating a common stock of knowledge through joint arrangements, courses and projects • Adjusting perceptions of the other part's work and reducing stereotypes • Reducing the cognitive distance between teachers and workplace instructors
Building relationships	<ul style="list-style-type: none"> • Creating new meeting places • Maintaining informal grounds for creating and maintaining a shared sense of purpose of the total training chains • Strengthen linkages to formal bodies and associations of the working life and the civil service
Incubation routines	<ul style="list-style-type: none"> • Negotiated flexible framework for how to incubate candidates into workplace through rotation

7.8.3 Integrative actions

The practice elements listed in figures 7.3 and 7.4 are temporarily connected and disconnected to each other in a pattern of ebb and flows. This is of course because the actors perform their work and contributions to the training chain in disperse social locations. Discrete elements need to be bound together to some extent during a school year. Consequently, connectivity, community-building initiatives, cultivation of relationships and communication of information and experiences across boundaries are important drivers for this practice to work. This occurs, for example, when schoolteachers and workplace practitioners meet in a cooperative forum and take up common issues related to training. When involved actors on both sides of the boundary meet to discuss training issues, they connect what happens in teacher teams with what happens at the workplace.

On the other hand, the data also exposes uniformly that binding the elements together is promoted by individual agency from the school's side. When for example a schoolteacher monitors the students' behavior in the workplace, and brings this piece of performance feedback to his or her colleagues in the respective teacher team, an important adjustment is enabled. As a result, important student performance issues can be brought to the team agenda, and the team is empowered to do something about problematic issues in many

instances. The teacher may respond to the workplace by informing those concerned about actions taken. In such a case, he or she acts like a broker or a translator. The data accounts infer that these brokering devices are decisive prerequisites for the shared practice to work as an adaptive instrument. Schoolteachers may contribute effectively to knowledge brokering, but they have limited time to do this. Furthermore, their connections to workplaces are restricted to only a few, simply because they are only responsible for a limited number of students' training. Not surprisingly, the empirical evidence points to the middle manager as the dominant boundary spanner and broker. Owing to the middle manager's multiple membership at different hierarchical levels, alongside extensive boundary spanning contact nets, he or she is well qualified to undertake brokering. The middle manager also has the formal authority to make on the spot decisions, when needed, for example in issues related to resources. The thesis therefore approaches this role incumbent as an important brokering agent in relation to adaptation.

7.9 The middle manager's context

7.9.1 Communicational arenas

The middle manager is the superior for a group of 15-20 teachers and a group of teacher assistants. Thus, the subject department constitutes a social context that provides frequent communication and relationships with people who are close to action. The middle managers and their subordinates are also physically co-located in the same landscape, which enables frequent interactions. Moreover, as middle managers also are regular members of the management team, they have access to the top layer of the school hierarchy through weekly meetings, and they thereby participate in school policy negotiations. Middle managers are also responsible for contacts with the pool of workplaces that are positioned to offer training opportunities within their occupational domain. However, they do not have any financial resources to bring into the negotiations about training collaboration, so their responsibility is restricted to informational and social contact. A summary of the middle manager's formal work context is presented in table 7. 5.

Table 7.5: The formal work context of the middle manager

Arena	Frequency	Issues in focus
School management group meeting	Once a week	Administrative issues and planning tasks Problem solving and coordination Development of shared understandings of school aims, objectives, concepts and routines
Subject department meeting	Twice a month	Transmission of information Exchange of experiences and exposure of practices Feedback from the workplace Dealing with variation and inconsistency in team practices
Meeting with each contact teacher	Twice a month	Instruction, student learning and behavioral problems Special needs and solutions for individual students
Performance appraisal with each teacher	Twice a school year	Autumn: Workload, work situation, upgrading of competence Spring: Job satisfaction, student learning and behavior, collaboration with the working life stakeholders
Meetings with workplace partnership institutions	Regularly, but variation across subunits	Organizing the job training and praxis Knowledge, motivation and behavioral status of students Collaborative competence building projects and courses
Meetings with core teams	Continuously	Issues related working life demands and on the job training of students Allocation of resources The team's repertoire and frameworks

Performance appraisals are held per year with each member of the teaching staff, and this management tool is most commonly integrated with planning routines of the school. Issues that are brought up during the appraisals with the teachers may be induced into the human resource planning of the school, because the routines are synchronized. Through regular meetings with the contact teachers, most commonly held twice a month, the middle manager may collect performance information about the students' status, progress and needs. Through the formal work role in concert with the multiple informal memberships and communication channels, the middle manager is uniquely positioned to form and maintain social linkages that cross internal and external interfaces.

7.9.2 Ad hoc negotiations within core teams

The interviewees were asked about perceived changes in their work role after the core teams were implemented as a sub-structure within their subject department. They describe uniformly that their daily tasks have changed due to this restructure. The changes do not primarily refer to the formal responsibilities and accountabilities as department heads. They are still in charge of the budget, the human resource management and the administrative tasks of the department. The changes in their work context are, however, due to the daily stream of negotiations, discussions, and within-group dialogues that take place in the core teams. When for example a teacher team perceives a need for management support, or face conflicts and problems, the middle manager is called for participation in the following meeting.

In other words, the middle managers describe that they have to work as facilitators; an on-hand human expertise centre for the teams within their subject department. On the other hand, when the middle manager him/herself perceives an unclear situation, he or she is free to intervene in the teacher team's meeting. Then the middle managers intervene in the teamwork in order to activate some sort of transformation. Such situations may for example refer to misunderstandings, unclear situations and ambiguities, and the focus of the transformer role is then to promote a shared understanding among the team members and the manager. The formal middle management role ensures access to all teacher teams. Besides, interactions are also strengthened by middle managers sharing the same physical location and being within arm's-length distance of each other.

Middle managers describe that they also have to interfere in conflicting or uncertain issues in the teams, where he or she must take part in discussion and problem solving related to difficult student cases, feedback from the workplace or dropout tendencies. On the contrary, the data also describes a proactive aspect, where the middle manager interferes with inputs, fresh experiences, or decisions from the school management group. In other words, the case data portrays a reactive problem-based side of negotiations within core teams, as well as a potential arena for playing a more proactive role. In essence, work within core teams, thus, has become an important context for exerting leadership influence at the operating level of schooling. The descriptions of the middle manager's work therefore point to a substantial negotiating function. The negotiations described have a double 'face': The first stream is about resources; time, physical spaces, degrees of freedom, prioritizations, budget funds and so forth. The other aspect of negotiations is about transforming understandings through dialogue,

discussion and the exchange of meaning and viewpoints. 'Messages', ideas, proposals and school objectives must be translated into the actual team context, in order to gain acceptance of a problem.

7.9.3 Aligning team practices at the subunit level

The middle managers were asked about the role of the subject department after the inducement of a team layer, and as reported, they describe that significant changes have taken place. What they underscore is the enduring need to utilize the department unit as a context for experiential learning. As the core teams are autonomous to decouple their activities from centralized school routines in approximately half of the school year, there is a perceived need for reducing some portions of the between team variability in practices. From this perspective, the subunit level, i.e. subject department meetings and similar forums, serves as a potential context for aligning team practices. The interviews take up this issue, although in different depths, and some of the middle managers report that they include these tasks in their action program. As stated by one of the middle managers:

But the existence of six teams within my department has confronted me with new challenges. I have to work more with the spread of experiences and solutions, also in order to prevent that the teams go too far in different directions.

(Informant No 2, middle manager, second interview)

The subunit is less important as a coordinative level, because most problems are dealt with within teams. Instead, this level of interaction emerges as a unique context for sharing experiences, as all the members from five or six teams are assembled - and they belong to the same knowledge domain. The subunit forums are, as such, sought to be used for aligning practices, in order to prevent too much inconsistency across teams. The role of the middle managers in the whole department context is, owing to this, more oriented towards being a translator and ambassador for 'best practices' acquired from the team practices.

7.9.4 Connecting occupational milieus to teacher colleagues

The data describes that social ties between the middle manager and business managers, cooperative representatives and specialists located in firms and public institutions as well as trade unionists strengthen connections to the working place area. In one of the cases, the middle manager also plays a formal role as head of the branch association of the business lines, and this union role union uniquely positions him to form ties to a wide range of partners. As described by one of the informants:

I have been elected chair of our local industry association for some years, and this position offers me a lot of contacts that are at my disposal in my role as the head of our department.

(Informant No 6, middle manager, first interview)

The descriptions point to strong relationships between middle managers and workplace stakeholders. *Firstly*, middle managers are responsible for workplace collaboration within their occupational domain, which brings a range of potential relationships with firms to the issue. Collaborative ties are formed with managers of workplace institutions to ensure access to praxis and apprenticeship. *Secondly*, the middle manager of the department also forms a range of frequently maintained relationships with the instructors at the workplace, and these linkages are set up in order to follow up students and to get feedback from the training camp. *Thirdly*, some of the middle managers have also cultivated personal relationships with cooperative bodies of industries. As stated by the same middle manager:

The collaboration with the branches has contributed with a range of benefits for all parties, and it has provided a lot of relevant knowledge to schooling and enabled the students to achieve success in their chain of schooling and training. The ties are built up by personal initiatives from both the school sphere and the business sphere, and our employer has delivered very few contributions, and I am not impressed by how the school bureaucracy value our collaborative efforts. They talk a lot about cooperation with working life, but take no initiatives. With us, it is the opposite, we do not produce so many buzzwords and nice talk, but we do a lot for business collaboration in practice.

(Informant No 6, middle manager, second interview)

The accounts portray an external role, where the middle managers utilize their connections with the working life to mobilize resources. These

resources comprise extra financial funding, political support, human resources and critical information. Mobilization takes the form of using personal contacts to apply for extra resources. The major vehicle is the proactive cultivation of connections to the working life partners, and the joint collaborative projects that unite teachers, workers, and instructors. Connectivity actions undertaken by middle managers also involves another important aspect, which is about keeping formal and informal 'corridors' open between colleagues and important external milieus in the working life. The activities go beyond being a member of a professional network himself or herself, because they are about 'opening doors' for teacher colleagues, and maintaining the open 'gates'. These liaising activities ensure that teacher colleagues have access to the target partners in the working life.

7.9.5 Internal mediation

Through participation in the school management team, teacher teams, subunit forums and external workplace milieus, the middle manager's role is portrayed as a 'broker'. The actor interviews describe this process in a two-way fashion, as issues are not only raised at the top of the department level, but also in the opposite direction. Brokering between teacher teams and the top management sphere involves the transfer of priorities, goals and understandings from one location to another. It is described as a time-consuming, although important part of their job. Conflict laden issues are typically financial priorities, distribution of budget funding, distribution of physical areas and classroom facilities and other critical resources. Clashes often occur between departmental interests versus the common agenda of the whole school. As one of the former principals says:

The management team meetings have occasionally been relatively brutal for some of the middle managers, because they have been expected not only to participate in distribution of resources between departments, but also to align conflicting interests and make decisions for the benefit of the whole school, not only their own department. In many cases, the choices made by the top team have been hard to return to their colleagues, for example, when they had to tell people that they have accepted reduction in their own budgets, because this was necessary in the interest and the situation of the whole school.

(Informant 12, former principal)

This form of ‘mutual ambassadorship’ means several conflict-laden situations, within teacher teams, the subject department as well as the management team, where the middle manager has to side to multiple considerations.

7.10 Integrating the elements

7.10.1 A learning structure identified

The descriptions of the Alpha site identify a genuine structure that enables mutual learning and adjustments of knowledge bases, understandings and practice repertoires among all partners involved in a distinct vocational training program. The learning structure is grounded on an informal community of actors involved in training within distinct occupational domains. The data also portrays that the motives, activities and projects go beyond the primary mission. A series of activities hosted by this community structure is not associated with instruction and training at all. For example, workplace specialists, school managers and teachers meet to some degree of regularity solely in order to update and develop their own competence. They also meet to discuss purely business relationships such as certifying industrial workers or ways of implementing ideas into reality. And some of the actors also meet in cooperative associations where they hold strict personal membership. The point is that this mass of social connections, professional discussions, joint projects, joint learning, meeting places and other purposeful endeavors are important building blocks in the informal part of the learning structure.

I see this social entity as a collective learning system, first, because it is utilized to improve the match between instructional actions of the school and realities among the schools’ external stakeholders. Seen from the school’s point of view, the learning structure works as a feedback mechanism, because it enables views, understandings and information to be transferred and shared across the school-workplace boundaries. But more important, this genuine structure enables adaptation and mutual adjustments to be made through negotiations within an informal occupational community. The recursive flow of knowledge and resources shapes a learning-dyad that enables schoolteachers and workplace trainers to adapt their activities mutually to each other. The social structure is grounded on discrete activities among actors that are dispersed at different locations in their daily work. The system, as such, is distributed in its nature, and it emerges from

interactions on three different levels: The core teams, the occupation bound network that spans the external school boundaries and the internal subunit forums utilized for diffusion of experiences and alignment of practices. A summary of the three-layer structure is shown in table 7.6.

Table 7.6: The learning system identified

COMPONENT	DESCRIPTIONS
Core team	<ul style="list-style-type: none"> • A micro context for adjusting teaching practices within a defined domain of responsibility for students
Subunit forum	<ul style="list-style-type: none"> • Alignment context for diffusion of experiences and information across teams
Occupation-bound network	<ul style="list-style-type: none"> • Integration of knowledge across school-workplace boundaries • Informal community for mutual adjustments of teaching and job-training • Informal community for shared enterprises

On the school's side of the boundary, the layer of relatively autonomous teacher teams enables rapid adjustments in didactical conditions, when for example feedback from the workplace points to such needs. The second layer, subunit forums, corresponds with discernable knowledge boundaries of occupational field. Subunits are also socially linked to their distinct occupational fields of the environments through the interactions of the subunit members. The subunit level thereby offers an integrative context for teams, because all team members are compulsory members. These properties make this context favorable for sharing experiences, although the data also uniformly points to the fact that diffusion of knowledge between teams is a difficult project. The third layer is the occupational network, which enables the adaptation of school practices to the training context of the workplaces. In summary, all three layers of this learning structure are utilized to create and maintain a commonly owned stock of knowledge that exerts substantial influence on both in-school instruction and on-the-job training of the recruits.

7.10.2 An extended middle management role

A central issue has been to capture the tasks and responsibilities carried out by middle managers within this formal and informal learning structure. Complex patterns of connectivity, negotiation and mobilization of resources have emerged from the descriptive accounts. These patterns of tasks, activities and engagements add complementary knowledge about the middle management role. Whereas official secondary documents describe the formal responsibilities attached to the middle manager's position in the school hierarchy, the accounts emerging from the data go beyond this image. Sources of integrator functions include both the formal access attached to the middle manager's position as well as the social ties he or she is able to use through engagement of occupational and personal networks. In table 7.7 below, different functions undertaken by middle managers in connecting people and knowledge resources are presented:

Table 7.7: Integrating functions of middle management

FUNCTION	DESCRIPTIONS
Negotiating interests and views within teams	<ul style="list-style-type: none"> • Negotiations between conflicting views and interests within teacher teams • Negotiations within the SMT
Proposing initiatives	<ul style="list-style-type: none"> • Utilization of information, knowledge and critical experiences to propose initiatives
Communicating experience between teams	<ul style="list-style-type: none"> • Communicating and bringing up experiences, proposals and ideas from one team practice to a setting where all teams participate
Facilitating team practices	<ul style="list-style-type: none"> • Helping teachers to master team collaboration, solving problems or allocating resources
Intervention in team work	<ul style="list-style-type: none"> • Intervention in team work based on own perceptions and judgments
Connecting colleagues to working life stakeholders	<ul style="list-style-type: none"> • Utilization of ties to the external working life to establish links between teachers and workers • Systematic connections of the subunit with external milieus through personal ties
Mobilization of resources	<ul style="list-style-type: none"> • Formal and informal access to resource pools • Working as 'ambassadors' for own domain, in order to mobilize extra surplus of resources

The descriptions specified in the table above, are all under-communicated in formal task descriptions and functional accounts in the organization chart of the school. The listed tasks point to a negotiating, synthesizing and integration function of middle management. Negotiations have furthermore, a double ‘face’. The first one is about negotiation about resources; time, physical spaces, degrees of freedom, prioritizations, budget funds and so forth. The other aspect of negotiations is about changing and adjusting understandings through dialogue, discussion and the exchange of meaning and viewpoints. The accounts therefore broaden the scope of the full complexity, and avenues of influence, associated with middle management practices.

7.10.3 Adaptive learning

The data of the Alpha site shows that the learning structure built in three layers is created, maintained and utilized, in order to enable schoolteachers and managers to adapt more effectively to their workplace counterparts. The data also describes three forms of learning, briefly illustrated in the table below:

Table 7.8: Three forms of adaptive learning

FORM	DESCRIPTIONS
Within team learning	<ul style="list-style-type: none"> • Dialogue and discussion within teams based on individual experiences and interventions • Negotiation of collective organization of instructional periods • Negotiation about allocation and use of resources • Construction of tailored curricula
Between team learning	<ul style="list-style-type: none"> • Sharing of experiences in a wider setting, where all team members of a domain participate • Alignment of team practices
Network learning	<ul style="list-style-type: none"> • Working towards shared understandings in meeting places, forums and projects, where workplace instructors meet schoolteachers • Adjustments of rules, frameworks and job-training tasks

All three forms of learning are iterative and cyclical in their nature, as they are continuously shaped and re-shaped. The reason is trivial, as problems and challenges occur and re-occur, simply because new students enter the scene under the same conditions and contingencies as the previous cohort. The body of practice-based tools, frameworks, and negotiated understandings is created and cultivated through a series of joint projects and activities that workplace specialists, schoolteachers and middle managers engage in. The learning routine is altered, modified and improved incrementally, in order to help practitioners deal with recurrent challenges. Seen from the school territory, this pattern can be understood as a problem-based collective learning process driven by actors within each of the subunits. The process is driven by perceptions of recurrent problems, mismatches and gaps in the existing structures and rules. Adaptive learning is, as such, problem based.

7.10.4 Loose and tight couplings in concert

The learning structure and social pattern identified in the data construct a learning infrastructure that is loosely coupled, although in a fuzzy fashion. *Firstly*, the team practice implies per se a case of temporal decoupling from centralized organizational routine, such as timetable routines and human resource management systems. Within time intervals, the teams are empowered to self-manage their own microstructure. At the same time, teamwork per se couples the individual work of the teacher, at least in principle, tighter to a closely-knit group of teacher colleagues. Compulsory participation and formal restrictions are means of power in that sense.

Secondly, as the pattern and structure identified is bound to distinctive occupational knowledge domains, the boundaries between the subject departments are strict. Variation in practices and de-integration between subunits, which are empirical characteristics of loose couplings, must be regarded as the normal case. According to the interviews, the central management corps has proposed several initiatives to align practices across the subunits. However, most initiatives have harvested limited effects, despite good will, simply because identifying relevant solutions, and thereafter transferring them across the subject department boundaries is not unproblematic. It is for example, not unproblematic to transfer tools and frameworks from a subunit that trains candidates to mechanical trades to their colleagues that prepare young people to work in hairdressing saloons or health clinics. Yet, through network engagements, joint projects and informal endeavors, tighter connections between each subject department

and external stakeholders are established. In result, *thirdly*, the learning structure portrays a mixed system that, on one hand, is loosely connected with the central hierarchy and neighbor subunits of the school and on the other, connected with the external world. *Fourthly*, the team practice represents a strong case of de-privatization of the teacher's work, i.e. tighter coupling. The case, as such, illustrates the simultaneous existence of both tight and loose couplings.

7.11 Summary

The descriptive accounts drawn from the investigation of the Alpha site provide insight into the formal and informal structures created to enable school actors at the local level to improve the fit between their daily work and the demands imposed from external stakeholders. Adaptation in the Alpha case means operationally finding an acceptable balance between the inclusive intake policy, deliberately chosen by the school management, and the successful incubation of students into apprenticeship. The balance aspect is an important property, because in theory, the school management corps might improve their work conditions by being more restrictive in taking in applicants with low cognitive status and special needs. However, they prefer to practice inclusiveness. The data also describes that inclusiveness is not only a deliberately chosen school strategy, but also anchored in broad cultural norms represented in the teacher corps of the school.

Although the teachers and managers argue for the appropriateness of being an inclusive school, the data portrays several forms of enduring dissonance occurring and continuously reoccurring. Dissonance as perceptual phenomenon therefore emerges as a motivational driver for adaptive learning. The daily use of the identified learning structure portrays a learning driven incremental change cycle. The descriptive data identifies three forms of integrative learning, e.g. within teams, between teams and in network settings. The redesign has changed the school design towards a more complex school with both tight and loose couplings. The school, at least when investigated in depth, emerges as a 'double knitted' organization with different layers aiming to solve different problems that all relate to improving the fit between instruction and workplace demands. Middle managers' crossover engagements are important components of the learning system, and they broaden the scope and perspective of school leadership from the middle. On the other hand, the descriptive account portrays a multi faceted and complex work role.

Chapter 8: Descriptive narrative of the Beta case

8.1 Introduction

In correspondence with the preceding chapter, chapter eight presents the descriptive data from the second subset of the case study, anonymously labeled Beta. Based on a similar logic as in the Alpha case, the data is presented in a descriptive manner, in order to capture the richness of the patterns and structural features identified. Emphasis is placed on the response strategies employed by school managers and teachers, in order to adapt rationally to contingencies found in the environments. The chapter starts with the school's basic profile, its functional structure and its management model. Thereafter, the chapter illuminates how various forms of contingencies and external demands are responded to at the micro level of the school. Major themes of the descriptive accounts are the restructure of the school into a team-based organization, inherent changes in the middle management role and social network engagements for adapting in-school instruction to workplace demands.

Although the two sub-cases may look similar at first glance, there are substantial differences, especially in terms of their contextual characteristics. They are drawn from vocational training within the same local community, but their course structure differs substantially. Moreover, in a similar vein, the two schools train young people to apprenticeship in quite different target areas in the local working life. Whereas Alpha educates and trains recruits into mechanical trades and construction businesses, Beta trains its students to occupations in healthcare and social services, restaurants, hotels and food-processing trades.

The two sites also differ in typical institutional character. Alpha is a well-established stable school with a long history within the same domains. In the Beta case, we see a young organization formed from the merger of formerly small independent schools. Their processes of change also follow different paths. Whereas Alpha exposes a scenario of an incremental process based on search and selection, and driven by a broad coalition, the Beta case demonstrates a typical top-down managed restructuring. The two sites therefore represent highly dissimilar cases in their social backgrounds, occupational contexts and management philosophies. The adaptive logics, however, are close to similar. Seen from this perspective, the two sub-cases expose different historical and social contexts, but the actors perceive similar problems and develop close to similar solutions, although there are some differences in the features.

8.2 Basic profile of the school

Beta is a ten-year-old vocational upper secondary school located in the Eastern part of Norway. The schooling is based on two broad programs, respectively Healthcare and Social Services and Hotel and Food-processing Trades. In addition, the school has built up a range of tailored special education programs. The school aims to deliver recruits to apprenticeship in the local working life after two years of schooling. Target workplaces for the education in Healthcare and Social Services are most commonly public institutions, i.e. kindergartens, municipal healthcare institutions, hospitals, municipal social services and pharmaceutical firms and drugstores. Students of Hotel and Food-processing Trades find their target workplaces in quite different branches, as they typically become apprentices in the food processing industry, canteens, hotels and restaurants. In the third leg of the school's provisions, special education programs are tailored for individual students with special needs. These students are taken into the special education department from jailhouses, social institutions and healthcare institutions. These young people have the same formal right to upper secondary education as other applicants. However, in practical terms, it has been difficult to integrate the students into normal schooling.

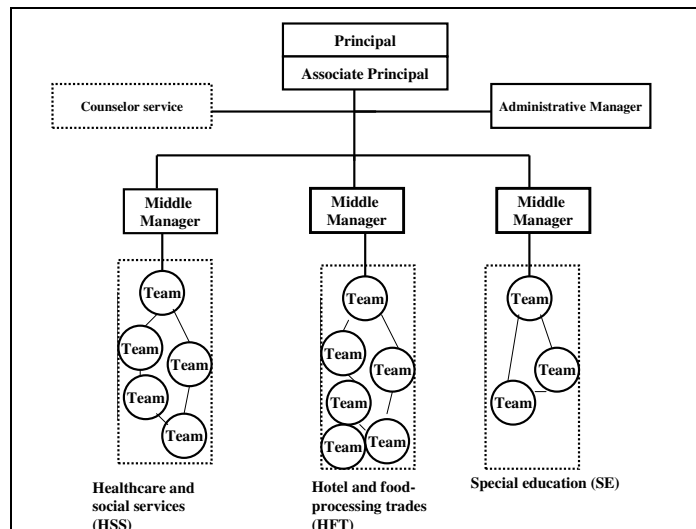
Under these circumstances, the intake to a tailored special school department is seen as the best possible solution. Besides, when students in other upper secondary schools within the county fall outside normal schooling, they are offered enrollment to the special education department at Beta. The special education services, as such, operate as an assembly unit for all the other upper secondary schools and social service institutions of the county. Consequently, the essence of this arrangement is a contract between Beta and the regional authorities of the county, aiming to ensure educational provisions for marginal groups of students. On the other hand, extra, surplus resources are granted to run this department, and Beta can utilize this externally funded capacity to serve its own students. Acknowledging that these students do not possess the social, behavioral and cognitive skills required for normal schooling, individual plans for each of them have to be designed. The internal complexity of the instructional work is high, due to the socialization problems of these students, along with the high amount of social interactions involved in organizing the teaching. The current number of students is 650, served by 70 teachers in approximately full positions.

8.3 School design

8.3.1 A team-based functional structure

The Beta site is structured with three subject departments each led by a middle manager, i.e. head of the department. The functional division reflects the distinctiveness of the occupational domains and their training programs, although each department covers multiple occupations. The functional diagram of the school is presented in figure 8.1.

Figure 8.1: The functional diagram of Beta



As the model indicates, each of the three subject departments is fragmented into a layer of four to six teacher teams, closely similar to the Alpha case. The inducement of a core team layer within each of the subject departments came out of a comprehensive redesign of the school, as described in more detail in paragraph 8.5. The teams are established as permanent constructions in the school design, with defined tasks, responsibilities and authority. Through delegation of authorities, the teams are empowered to self-manage large portions of their human resources in accordance with priorities decided by the group. Teams are also empowered to decouple their instructional tasks from the central time-table routine, when perceived necessary and they are armed with formal authority to create individually tailored plans for students. Student groups and classes are also visibly and

tightly coupled to their teams, so that they belong to a defined group of teachers within their subject domains.

8.3.2 The school management team

After the redesign of the organizational structure of the school in 2002, the school management team includes the school Principal, the Associate Principal, the Administrative Manager and three middle managers. Their tasks and responsibilities are briefly summarized in table 8.1.

Table 8.1: Administrative responsibilities of the management team members

POSITION	RESPONSIBILITIES
Principal	Overall planning, external relationship, follow up of middle managers, curriculum implementation, reporting to the school board and civil services, developmental projects
Associate Principal	Human resource management including vacancies, pension issues, turnover, hiring of personnel, report routines
Administrative Manager	Educational planning, instructional routines, quality assurance systems, student assessment, student related issues
Middle Manager	Head of department, management of department staff, implementation of tariff agreements in practice, departmental co-ordination, internal co-ordination with the two other middle manager colleagues

The school's principal is a full-time manager, and as in the Alpha case, he is also a civil servant with some juridical responsibilities included in the work role. The associate principal position is close to a full time manager, and he / she is the formal substitute in the principal's absence. In such cases, he or she also has the formal authority to negotiate on behalf of the school owner, i.e. the county administration. The administrative manager is also close to a full-time manager, and he or she is a free role incumbent without any directly subordinated staff. The administrative manager is, on the other hand responsible for reporting and educational planning, support functions for teachers, cross-departmental functions and student services. Each of the three middle managers serves as department head in approximately 70 % of a full position, which means that they teach in a minor position in their subject domains. The observations identified a strong rhetoric of team

leadership, also when inspecting the official documents. Two designed instruments are used in order to develop a team-based repertoire at the top of the school hierarchy. *Firstly*, the management team is collectively responsible for some issues and tasks that are not delegated to any particular role incumbent. Such issues are whole-school planning, curriculum implementation, school-wide policy of human resource management and financial priorities. These tasks and responsibilities, so to speak, are left to be solved collectively by the team. There are, as such, some gaps in the administrative task structure, and, furthermore, these gaps must consequently be negotiated and filled within the group of school managers. *Secondly*, and equally important, the interviewees also argue that these negotiations are essential, in order to develop shared understanding of important subjects, and, in a similar vein, shared conceptions of how ideas are to be implemented in practice. As described by the principal:

We deliberately prioritize the school management team meetings, by using large amounts of time in working together, in order to get a common focus and a shared understanding of what is good schooling in our context, and how we should undertake our leadership tasks to reach our goals.

(Informant No 21, principal)

The descriptions given by the informants lead to a similar interpretation: Management team meetings are time consuming, because they are also utilized as an integrative mechanism in order to shape shared understanding of school-wide issues. However, it emerges relatively consistently that these negotiations also are laden with conflicts. As stated by one of the middle managers:

Our management team meetings are not conflict-free. The discussions may be rough, although we agree upon many issues, and occasionally, I have to return to my department with decisions I am not happy about. Departmental independence, rooted in our particular context, versus whole-school routines is a recurrent source of conflict within the management group.

(Informant No 17, middle manager)

The citation above is representative for all three middle managers. They appreciate the management team negotiations, and value their significance for the establishment and maintenance of a basis of shared conceptions and understanding. Nevertheless, at the same time, they describe conflicting situations and personal role stress when they propagate decisions made by the management team.

8.4 The cultural-institutional context of the school

The accounts emerging from the interviews describe three cultural themes shaping the institutional constituents of the school. The overarching cultural trait clusters round strong norms of inclusive schooling. The inclusive norms are supported and defended within both occupational domains, although sub-cultural differences are consistently described. Cross-departmental cultural differences have been a recurrent theme since the merger in 1996, often associated with different paths of teacher recruitment and occupational background. Whereas schooling in Healthcare and Social Services is grounded on a nursing tradition, the other branch has its roots in industries and service production in canteens and restaurants. A series of secondary documents, such as evaluation reports and working papers, describe different sub-cultures between the two groups of teachers. Similarly, to merge these two parties towards a unified school culture has been perceived as a challenge over the years. As one of the school managers puts it:

The way I see it, our three departments expose different subcultures. Within healthcare, a care-oriented culture can be observed, and they expect the task to be delegated and solved on the lowest level. Within the hotel business, they come from an industrial tradition, and expect the head of the department to cut through and make decisions. It does not necessarily mean that teachers exert less influence on choices than their counterparts in healthcare and social services do, but the expectations are different. They are less process-oriented, have less room and space for discussion, and expect choices to be made by the boss.

(Informant No 20, administrative manager)

The larger point is, however, that the inclusive school norms have a strong standing in both sub-culture camps. The norms for example, are manifested in the extensive willingness to take in students from the lower achievement categories, alongside applicants with disadvantages and special needs. The total share of students from the special intake is next to 20%, but it is in fact higher when the students of the special education department are included. Moreover, the data also describes that schoolteachers propagate a strong identification with their respective field of occupation in the working life. This norm is for example manifested by the number of ties between school professionals and their working life counterparts, and furthermore by the stability of the relationships. Schoolteachers expose a strong focus on methods, strategies, tactics and tools of how to incubate students successfully into workplace integration, simply because it is a norm of

appropriateness within their professional group. Despite some sub-cultural differences, the inclusive school norm, paired with strong occupational identification, thus, construct a visible portrait of the cultural basis of the Beta site.

8.5 The external environments

The descriptive accounts expose a series of pressures, demands and expectations imposed from the local environments. External demands of a technical nature are paired with a complex and challenging work technology in the classrooms. The sub-case, therefore, provides insights into the response patterns employed in action.

8.5.1 External influence

Even more consistently described than in the Alpha case, the informants of Beta describe that they perceive their technology as steered by the external local environments. Two features are especially distinguishable from the descriptive accounts presented. *Firstly*, the intake system surrounding the school exerts strong technical influence on the operating conditions for teachers and school managers, in terms of an increased inflow of low-performing and less motivated students. Moreover, the school's official role as assembly unit for candidates recruited from social institutions, amplifies the effects of the general intake system. Since intake practices determine student grouping in the classes, this is understood as a strong case of external influence on work conditions for teachers and school managers. *Secondly*, the external working life environments exert strong influence on the working conditions of schooling simply because they impose demands, pressures and clear expectations of the standards required for work in their businesses. When students enter the workplaces, for example in the praxis rotation during their first school year, they are confronted with a series of strong demands of what kind of behavior that is appropriate. For example when students enter kindergartens or healthcare institutions for practical training, they have to adapt rapidly to security rules, client care routines and standards of how to meet parents in an appropriate manner. This is not at least the case for students who do their training in hotels, restaurants and food producing industries. When for example young students are to learn the procedures, by which food is quality assured, there is little or no room for deviance. The body of detailed rules and standards are massive, and students have to adopt

these through steep learning curves. In consequence, when students do not meet the expected standards, conflicts arise. This pattern is especially manifested in commercial projects, where the students have to deliver authentic customer satisfaction. As described by the middle manager:

We have a lot of rules and regulations that must be implemented in the students' daily work, and we cannot accept any deviance from our students. We operate with 140 students in large projects, and there is little tolerance for not following the rules. When this occurs, I need to take action. I then often feel like a 'bitch', but we have developed an atmosphere for taking up conflicting issues in our department meetings, although the temperature can occasionally be rather 'hot'.

(Informant No 19, middle manager)

Work efficiency, control, collaborative behavior and customer relationships are central training themes, where the demands from the workplaces are strong. The demands are impossible to bypass or ignore over time, and schoolteachers therefore have to allocate a great deal resources in their daily work, in order to prepare young people. Consequently, socialization is an important component of the in-school part of the training program, and the informants describe that they must allocate a substantial amount of time resources, in order to prepare young people for meeting working life standards.

8.5.2 Proactive instruments

Teachers and middle managers of both vocational lines describe a work situation where they experience strong technical influence from the workplaces, and furthermore that they are externally dependent of their stakeholders. Nevertheless, at the same time, a series of proactive action strategies are described and specified in relative detail, and occupational networking is a predominant one. Moreover, especially within food processing trades, students work in real life commercial projects, for example large-scale catering arrangements. School professionals and students work side by side, where a series of technical standards, security rules, and customer demands must be appropriately met. Such projects also require certification and official approval from food control authorities and they are therefore important socialization arenas for students. The informants also describe that the team infrastructure within each subject department is utilized proactively as a context for taking up this stream of workplace

related issues. Through collective efforts together with teacher colleagues, it is described as easier to deal with such complexities.

8.6 Redesigning the school organization

Before 2001, Beta was structured in terms of a traditional collegial model¹⁰² of school administration, which was the mainstream design across the whole sector in Norway before 1996. The core trait of this arrangement was the restriction of formal authority to the principal's position. The principal however, was supported by a line of administrative inspectors and curriculum coordinators in his or her daily work, but neither of these two groups had any formal management authority attached to their work roles. Curriculum coordinators were typically teachers with some restricted coordinative functions added to the teacher role. Administrative functions were strongly regulated and specified in detail by a tariff agreement between the state and the trade unions. This specific institutional arrangement was grounded on a strong norm of collegiality, and in practice, subject departments were managed by a curriculum coordinator and teachers in collaboration. Across the entire upper secondary sector, the traditional administrative arrangement was replaced by a line management model in the last part of the 1990s¹⁰³. In the Beta case, however, the traditional arrangement was maintained for another additional period.

8.6.1 Changing the administrative structure

When the newly appointed principal attended the school in 2001, the situation was described as more or less 'over-mature' for changes to be launched, as most staff expected substantial changes in the administrative structure to take place. There was also a widespread perception among the staff of 'lagging behind', because they saw that Beta maintained a model of school administration that was perceived as old-fashioned. At this point in time, line management principles had been implemented more or less throughout the upper-secondary school field of Norway, first of all by the replacement of curriculum coordinators and inspectors with middle managers. The associate principal describes this situation as follows:

¹⁰² See Dimmen (2000); Dimmen and Kyvig (1998) for descriptions of a collegial education management model

¹⁰³ See Paulsen (1999b) for descriptions of this comprehensive reform within the upper secondary sector in Norway

We had been expecting a re-organization process to take place for several years. We had also gone through several developmental projects since the early 1990s, but most efforts failed. Various proposals came up, but the teaching staff 'voted them down', so to speak, and there was not sufficient political will at the top of the school hierarchy to implement proposed changes. Nevertheless, moving towards the end of the 1990s, people saw that changes also had to take place at our school, since we saw changes in leadership and management design at most other schools within our county.
(Informant No 16, associate principal)

As such, the renewal of the administrative structure was made in a symbolically favorable situation, because the teacher staff expected some major changes to take place. Furthermore, they perceived their own official organization as untidy, old-fashioned and deviant from the arrangements that have gained hegemony within the region and the whole sector. He or she describes a situation of few conflicting views and different opinions about the available alternatives regarding a redesign of school administration. A mainstream design with a school management team and three middle managers as heads of the subject departments was implemented during a relatively short period. Changes could be launched and implemented rapidly in this situation. In addition to the reform-pace, the change process was managed in a typical top-down fashion. However, due to the circumstances and political climate, the change has been described as relatively conflict-free, and this interpretation goes through all interviews. As the new principal puts it:

I entered a school that was very old-fashioned in structural terms, - a small school that had grown and expanded rapidly without adapting its formal organization. But the organization as a whole perceived that some changes had to be made, but there was a lack of systemic grip. When we initiated the process, things happened fast. We had no problem with the introduction of heads of department as the unity of command for the teachers, and I was very conscious that it should not be possible for the teachers to bypass the middle managers.
(Informant No 21, principal)

8.6.2 Wave two – the departmental structure

Shortly after the line management model was established, a reform of the internal departmental structure was launched. The point was to couple the work of academic teachers tighter to the didactical conditions of the vocational training curriculum. This consideration was more strongly

emphasized after the effects of 'Reform 1994' had been visible for some years. Teachers in academic subjects became hierarchically organized into the two training departments. This meant for example that teachers in English subjects became subordinates to the head of the department of healthcare and social services. This design parameter reflects a deliberate school strategy, which, according to the interviewees, caused some minor disputes between the management corps and the teachers in academic subjects. The latter group preferred to maintain their own academic subject department, which was rejected. The subject-departments are thus sought to work as integrated knowledge domains, aiming at adapting academic subject knowledge to didactical conditions of the vocational training programs. Yet, most teachers saw the problematic sides of having teaching in academic subjects decoupled from the didactical conditions in training.

8.6.3 Wave three- reforming the operating core

A third reform wave was initiated shortly after the redesign of the administrative structure. The top of the school hierarchy launched the proposal of redesigning the operating core of the school, i.e. the subject department. The core of the proposal was a decomposition of the subunit into a layer of teacher teams - based on compulsory participation and teacher collaboration. The rationale for building this inner layer within the subunits was, *firstly*, to transfer instructional decision making closer to action, and, *secondly*, to strengthen student learning through a system of tighter follow-up activities.

The interviewees describe various motives for this third restructure, which was more radical for the teacher corps, since it interfered directly with their work context. The management core perceived urgent needs to construct a closely-knit work context that would enable adjustment of didactical conditions when situations required it. The backdrop of this perception was a more diverse and demanding student group, which required more tailored learning frameworks. According to the interviewees, attitudes and opinions among the teacher corps were more divided, but strong pro-arguments emerged from the observations of more problems with dropout and absence among the students. Among the teachers, decreasing job-satisfaction became a problem, especially among those that served the most demanding student groups. Besides, the school managers wanted to create a context that enabled a more collaborative style of doing the work as teachers. Furthermore, a central idea was that the core teams should be allowed to decouple their activities from the central timetable, and, thus, create individual plans for

students. Accordingly, they are enabled to make priorities and decisions regarding instructional material and methods in order to tailor instructional provisions to students' needs. The conflict level was high during this third reform wave, especially between the principal and the formal representatives of the teachers' trade unions. Among the ordinary teachers, opinions were more divided. The process was organized in a typical top-down fashion, and resistance and protests from trade unions were neglected, although all formal procedures of negotiation and hearings were satisfactorily practiced. These descriptions consistently cross the whole sample of interviews and secondary documents. Nevertheless, the ideas of team technology were implemented from 2002.

8.6.4 A trade-off between control and autonomy

The work of the core teams is based on a balancing act between structural control and group autonomy. On one hand, membership and participation in core teams are compulsory for all teachers. The teamwork, thus, implies that each teacher is more physically bound to the workplace than earlier, in order to ensure availability and collaboration in prioritized teamwork. On the other hand, the team structure itself allows more self-regulation at the group level, because all teams are empowered to make some professional decisions in issues related to didactical conditions and instruction. So within the same formal arrangement, the teachers are both more steered towards compulsory participation and collaboration, at the same time that as a group, they are enabled to utilize more degrees of freedom in issues related to instructional decision making, time management and planning their own work. The associate principal describes this balancing act as follows:

The teachers work more together, they collaborate more tightly, than before we introduced the teams. They can also decide to loosen up their work from the central timetable, which gives them more space for self-regulation. On the other hand, the changes in the tariff agreement bind the teacher more to the work context than earlier. We have adapted the tariff regulation in a fashion that within a defined amount of time, so-called core time, the teachers have to be at school, whether they do classroom instruction or not.
(Informant No 16, associate principal)

As the team members have a defined joint responsibility for a group of students, this construction is perceived with a stronger common ownership for the students' learning, and tighter student follow-up. In practice, self-regulation means that teams are enabled to decouple their activities from the

central timetable within defined periods. This provides a space' for tailoring instruction more tightly to the group of students they serve. As one of the middle managers puts it:

Each team consists of 4-5 teachers, and they have several degrees of freedom. They can decouple from the timetable within defined periods, and they can adapt educational provisions and tailor instruction to special conditions when needed. They also have several degrees of freedom in organizing the subjects. They are in practice self-managing teacher teams, but I participate in the meetings when important decisions are to be made.
(Informant No 18, middle manager)

Core teamwork is also defined as a formal part of the school's organization and is attached to components of the teachers' tariff agreements. There are, as such, no 'escape routes'. In a collaborative team setting based on such a degree of formalism, membership is an issue with potential embedded conflicts. The formal authority of choosing the team composition is delegated to the middle managers: Although team composition in most cases follows a natural path, governed by teacher competence and experience, the final decision of team membership is in the hands of the middle manager.

8.6.5 Changed role of the subject department

According to the interview descriptions, the construction of a core team layer within the subject department has gradually changed the nature of the subunit itself. This is mainly because several of the most frequently discussed issues have naturally been transferred to the core teams, simply because the teams are empowered to discuss and resolve them. On the other hand, this situation has opened up for using the department level to deal with other issues. The department meetings, for example, are extensively used to take up quality issues of instruction on the agenda. Furthermore, the department meetings are also extensively used to share experiences among teachers that belong to different teams, in order to reduce variability in practice. As one of the middle managers puts it:

The introduction and implementation of a core team technology has also changed the nature of the subject department and the department meetings. The building block of the subject department now is teams, not solely individual teachers. We focus and use the department meetings to diffuse experiences across teams and classes, and I see this forum as an important unit for collaborative learning between teams. The subject department meetings are used to put within-team differences, quality problems and deviance from routines on the agenda.

(Informant No 19, middle manager)

As pointed to by the informant, delegation of authorities to a close-to self managing team layer, represents a risk of variability per se. In consequence, an organizational space for aligning practices, sharing experiences, in other words, - between team learning - is required. Various subunit forums have sought to fill some of these gaps, although not entirely. Several daily micro decisions and situations have to be resolved through intervention and facilitation from the middle managers.

8.7 Linking school practices to workplaces

The sub-case describes an extensive pattern of collaboration between school managers, teachers and workplace actors within each of the school's two occupational fields. The collaborative activities are domain-specific, because they connect school actors in a specific knowledge domain with their corresponding occupational environment. For example, teachers within food-processing trades establish connections with industrial firms in food-processing branches, alongside hotels and restaurant businesses. Similar collaborative patterns are found in a range of healthcare services, between teachers and school managers on one hand, and kindergartens, pharmacy retailers, healthcare institutions on the other. The pattern of collaboration, as such, follows distinct occupational boundaries.

8.7.1 External relationships

The descriptive accounts portray an occupationally bound social network, structured by relationships between occupational specialists that carry out their daily work in disperse locations. Although they are engaged in the same mission, i.e. training and socializing students into apprenticeship, their work and activities are discrete. Through a pattern of frequent interaction around a series of projects of joint interest, they merge a pool of resources, activities

and social connections. The main players in the collaborative construction are teachers and their corresponding job-training instructors in the workplace organizations. They are connected through professional ties that are formed over years of collaboration. The data portrays a social construction of about 50 external workplace organizations, both public sector institutions and private businesses, which are connected to the school's knowledge domains through social ties and a series of joint projects and activities. As the associate principal sums up:

We have built up a pool of partner institutions, where more than 50 firms have joined us in a stable collaboration. These relationships are decisive for the success of the students in fulfilling their ambitions of achieving an apprenticeship position. Most of the contacts and relationships are run by the teachers, the school managers, but first and foremost, the middle managers of each department. The relationships are, to a large extent, mutually constituted. Companies are active parts in student supervision and guidance in the school area, in order to support the students to make optimal decisions, and, of course, to recruit candidates.

(Informant No 16, assistant principal)

The collaborative activities follow a distributed pattern: They refer to the same aims and objectives but take place in different locations. The network is furthermore local in nature, because it shapes and re-shapes its structure within a geographically delimited territory.

8.7.2 A portfolio of joint projects

Emerging from this pool of collaboration is also a series of joint projects. For example, the department of Food-processing trades is extensively engaged in the certification of workers in hotel businesses and food processing industries. Beta has for example a permanent and stable collaboration with the branch office for food processing trades. Due to this connection, food-processing companies regularly use Beta as a center, where the workers can have their competence assessed and certified. Turning to the other subject department, similar patterns are found in relation to public institutions, for example kindergartens. These activities are also followed up by tailored courses for workers who need them.

For example, during school year of 2004-2005, more than 80 workers from local food processing industries were enrolled into this certification program. The following school year, the same businesses purchased tailored courses

from Beta, in order to strengthen the competence base of the workers. A range of other similar projects and enterprises have been specified through the data collected, and a brief summary of the most important crossover enterprises is listed in table 8.2.

Table 8.2: The projects and enterprises

PROJECT TYPE	EMPIRICAL DESCRIPTIONS
Certification of workers	<ul style="list-style-type: none"> • Industrial workers are trained and certified at the school through a tailored program • Initiated and sponsored by branch offices and association bodies • Certification courses are coordinated at the subunit level of the school
Joint courses	<ul style="list-style-type: none"> • Joint courses for teachers and workers from the working life field • Arranged both inside and outside the school territory
Crossover arrangements	<ul style="list-style-type: none"> • “Open school” sessions • Workplace partners are ‘imported’ to sessions where they meet the students at an early stage of the in-school part of the program
External professional summits	<ul style="list-style-type: none"> • Teachers, school managers, workers and managers meet in professional occupational settings conducted by cooperative and associative bodies • They have common meeting places outside school where teachers meet workplace specialists informally • Formal meeting places through joint membership in trade unions and associations

The portfolio of projects, student incubation arrangements, business projects and joint courses create a supportive belt round the primary mission of training students. In its effects, this social belt creates many additional opportunities for the actors involved in training to have discussion, dialogue, negotiation, workshops and professional collaboration.

8.7.3 A sponsored network

The descriptive data is also informative about important linkages to working life stakeholders that are not directly involved in training activities. Such stakeholders are local and regional business chambers, branch offices, trade unions and public services that in many cases may play the roles as supportive agents. On the other hand, these parties are at stake with vocational training and, more importantly, many of them are positioned to offer additional resources: Political support, extra surplus of resources and external legitimacy in the local working life. Although they do not engage actively in the core activities, they form a surrounding supportive belt and are important allies. Beta has been rewarded by the Confederation of Norwegian Business and Industry¹⁰⁴, due to their close relationship and wide-ranging engagements with the industrial branches, into which the school aims at socializing recruits. As perceived by the informants, this supportive belt of associative stakeholders provides the school managers and teachers with extraordinary legitimacy and access to the target field where their students seek to achieve an apprenticeship position.

8.8 The practice repertoire developed

Interviews with school managers and teacher teams have aimed to map properties of the repertoires in action within teams, between teams and in negotiations with the working life counterparts. Group interviews of teachers, for example, describe that they proactively use this professional network, often strengthened by prior career linkages, in order to incubate the students to the workplace field. Since the teachers also have a layer of flexible core teams close to the students at their disposal, these informal ties create connections between the operating core of the school and its workplace environments. The patterns enables a set of guidelines, negotiated principles for training, informal rules, sub-routines, joint agreements and shared understandings to evolve. This body of practice-based framework guides, at least to some extent, both in-school instruction and socialization and training on the job.

¹⁰⁴ In Norwegian: NHO

8.8.1 The team practice – a decoupled instructional routine

The core of the team practice is a model that enables teams to decouple their work from the centralized timetable routine when needed. The model intentionally empowered the team layer to determine the utilization of some amounts of the time resources of the teacher members. Consequently, autonomy at the team level is a central element. Instead of calling for administrative support, the core team as a group is enabled to discuss problems, recall possible solutions, make choices and try them out in a practical setting within a short period. Furthermore, this repertoire is strengthened by the tight coupling between the team and their students, because the students belong to a team, and therefore have mutual access to each other. The practice repertoire of the teamwork is summarized in table 8.3.

Table 8.3: A model of the team practice

PRACTICE ELEMENT	EMPIRICAL DESCRIPTIONS
Adaptation and tailoring	<ul style="list-style-type: none"> • Individualizing of curricula and plans for students with special needs • Level-differentiation of instructional provisions within fixed periods • Tailored in-depth work periods that are pre-defined
Decoupling	<ul style="list-style-type: none"> • Decoupling locally governed instruction periods from the central time-table
Coordination of workplace socialization	<ul style="list-style-type: none"> • Gradually incubating students to a workplace organization through the praxis rotation • Agendas more focused on motivational and behavioral sides of the future apprentice job situation
Integration of workplace demands	<ul style="list-style-type: none"> • Workplace demands on the agenda of the teams
Collaborative projects with working life partners	<ul style="list-style-type: none"> • Coordinating of tasks related to joint projects • Tasks related to supplier jobs for the working life partners and cooperative branch agencies

School managers and teacher team members were all asked about their perception of the students' situation in a team-based working technology. A major perception brought up during the interviews, is the image of reduced dropout, less problems with student absence, alongside increased teacher job satisfaction. As the team members have a defined responsibility for a group of students, this construction is associated with a stronger common ownership for the students' learning, and tighter follow-up of the students.

8.8.2 Constructing a shared practice with the workplaces

The informants describe that the pattern of collaboration between school actors and workplace partners has contributed to a shared repertoire that spans both in-school instruction and on-the-job training. The large number of joint activities, meeting places and projects are perceived as having contributed to a relatively shared conception of vocational training among the involved actors. Elements of such a shared repertoire are adjusted to organize the in-school instruction, so that the progress of the students fits better to demands from the workplace. Similarly, a shared repertoire also grips into routines of how to incubate students more effectively into the workplace reality, so that they are better prepared to master the challenges that they meet there. The repertoire comprises for example interview sessions with the candidates at the end of their school program. As described by the associate principal:

The workplace institutions carry out interviews informing the students what it will mean to be at the workplace in their organization, and what an apprentice is expected to contribute with, how they are supposed to dress, behave and treat clients and customers. The workplace managers assess absence strongly. Behavioral and motivational factors are also weighted during the assessment, as well as what kind of attitudes the candidates display during the interviews.

(Informant No 16, associate principal)

Shared repertoire also comprises adaptation and tailoring of didactical conditions in the job-training context, conditions that may help the students to overcome some of the barriers. The descriptions from the interviews portray a set of informally grounded paths of mutual influence that over time has elaborated shared conceptions and understandings, including mutual respect for the particular roles and considerations each part of the training chain has to take into account. The important point is that this practice repertoire makes contributions towards integration of in-school activities with training in the workplace.

8.8.3 Perceived outcomes

The major perception described during the interviews is that most students that want an apprenticeship contract are offered one, even in cases where students have not fulfilled all the advanced courses. They are allowed to come back to the school to do their exams during the apprentice program. The informants also claim that this remarkable ratio is positively affected by the social investments and endeavors in working life collaboration. However, not all students want to go into apprenticeship. Some prefers to continue a third advanced course, and get their general certificate that ensures them the right to apply for further education instead. As the administrative manager describes it:

We find it satisfactorily that many of the students are offered an apprenticeship contract from the same location where they have had their on-the-job praxis periods. The apprenticeship is a continuation of the schooling, and an integrated part of the program, accordingly, the linkage between school and working life is very important.
(Informant No 20, administrative manager)

The most severe barrier for raising achievement is represented by the dropout cases, where students finally drop out of school during the first two years, most typically after a period of lagging behind the normal study progression. The main reason for this phenomenon is perceived to be lack of prior capacity, and this problem is, not surprisingly, most severe among the special intake students.

8.9 The middle manager's work context

8.9.1 Communicational arenas

The middle manager is the superior of a group of about 15-20 teachers, in addition to a group of teacher assistants. They also teach approximately 1/3 of a full position, which also implies ordinary membership in teacher teams. The middle manager of each department is responsible for human resource management, instructional planning and administrative tasks within the subunit. A brief summary of arenas and communicational forms is presented in table 8.4 below.

Table 8.4: The middle manager's formal work context

ARENA	FREQUENCY	ISSUES IN FOCUS
Performance appraisal with teachers	Yearly	Instruction and student learning Special needs and solutions for individual students
Department meeting	Once a month	Transmission of information Exchange of experiences related to administrative solutions, curricula and instructional materials External projects
Management team meeting	Once a week	Administrative issues and planning Dialogues upon goals, conceptions of pedagogy, objectives, routines and financial priorities Performance feedback of students
Consultations within teacher teams	Regularly, but in an ad hoc fashion	Resources, student cases, problem solving, experiences with the work technology
Coordination with middle management colleagues	Regularly	Alignment of practices across subunits Coordination of tasks Negotiation about how tariff agreements shall be practiced
Meeting with workplace partner institutions	Regularly	Organizing incubation, motivation sessions and rotation of periods Negotiations about intake of apprentices

8.9.2 Changing role of middle management

The middle managers in the sample describe that the tasks and responsibilities of their work role have substantially changed following the implementation of the team layer. The middle manager is still in charge as the head of the subject department, but different from earlier, the middle manager now is responsible for the support of 3-6 close-knit teams that are empowered with a certain degree of autonomy in instructional issues. The focus is now more oriented towards supporting teams and undertaking regular negotiations within teams and across teams. The role is also described as more complex and work demanding after the redesign of the operating core. This brings issues that are more complex to the forefront, e.g.

intra-group conflicts of different kinds. As pointed to by one of the department heads:

This way of organizing teacher collaboration and teacher work implies that my work role as a middle manager has been radically changed. I manage basically self-managing teams and to a less extent individual teachers. This means that I circulate between teams and engage in several within negotiations. My role is often to facilitate discussions, give inputs and feedback on their work and raise critical questions.

(Informant No 18, middle manager)

Middle managers are responsible for team-composition, so that they can work at least at a minimum level of effectiveness, and this task brings negotiations with teachers about team membership to the surface.

8.9.3 Negotiations within teams and between them

The interviews portray a complex role infused with group relationships and negotiations. Middle managers participate in regular working sessions in the teams, in order to observe their work, supervise the colleagues, undertake negotiations and manage conflicts. A substantial portion of the workload therefore takes place within the teams for which the middle manager is responsible. Handling within-group relationships has thus become a more substantial part of the regular workload. The descriptive data indicates a facilitator role in all cases of the site, where the middle manager in practice tries to stimulate collective reflection, dialogue and discussion. As one of the middle managers puts it:

The change in my role is manifest by the fact that I now have to deal more with group relationships, both within groups and between them, and thus have to walk across many arenas in my work. I engage in several within team negotiations. My role is often to facilitate discussions, give inputs and feedback on their work and raise critical questions.

(Informant No 18, middle manager)

The interviews bring up the issues of different practices arising from the relatively autonomous teams within a subject department. The middle managers were asked about how to deal with this issue, and their

descriptions underline a need to align practices across teams within the same subject department. Two mechanisms are exploited by middle managers for this agenda. *Firstly*, department meetings are now used to share experiences and to align practices. As stated:

In addition, I have to manage the department meetings as a unit for sharing of experience, professional discussions and problem solving as a community of teachers within my department.

(Informant No 18, middle manager)

The middle managers describe themselves as facilitators of this process, simply because they have close to perfect information about different practices through their daily consultancies among teams and team members. They are therefore uniquely positioned to identify variability. They also have a forum and an agenda to take up such issues through the department meetings. *Secondly*, the whole subject department, i.e. all team members and students, is mobilized through external projects, for example commercial enterprises for large arrangements, where the quality of deliveries has to be assured. These projects also contribute to alignment of team practices through their integrating function.

8.9.4 Linkages with external milieus

As described by middle managers and other informants of this site, middle managers use considerable energy and resources to create and maintain social linkages to their corresponding working life, i.e. the target area for the job-training. As stated:

The teachers and the heads of the department are creators of networks to the working life, and the school benefits largely from this collaboration.

(Informant No 20, administrative manager)

As underscored by teacher informants, they maintain a series of social links to the workplaces, often based on a personal contact network. But also, as underscored, they all highlight the role played by middle managers, due to the number of ties to a wider range of workplaces. And likewise, due to their formal access to several decision making contexts, paired with their formal authority, they are described as effective creators and cultivators of these kinds of network relationships.

8.9.5 Bridging internal milieus

The middle managers are offered a range of boundary spanning opportunities in their daily work. Bridging teacher teams and the top management sphere of the school involves communicating priorities, goals and understandings from one location to another, which is described as an important leadership capacity. However, the data accounts are far more intense than in the Alpha case and also describe role conflict and tensions, through conflicting expectations, priorities and interests, as a recurrent and stable characteristic of the work role. Several tensions refer to conflicting views on how tariff agreements and directives from the civil services should be implemented, others to tensions between the central office of the school and the local department culture. As described:

I feel the pressures from both the top and the bottom, with which several conflicts are related. But when the pressure from downstairs in the organization is massive, then you need to act like a diplomat. We have relatively intense discussions in the management team at the top, but we have a culture for backing up the decisions we have made when we return to our departments, although some decisions are hard to defend. Such issues are seldom related to money and pedagogy, it is rather about how people shall be managed, how strict regulations shall be followed. I feel such issues occasionally difficult, because I manage a very service-oriented and flexible staff, and I think flexibility should be more two-way. But we do a lot of stuff together, both professionally and socially, and collaborate tightly.

(Informant No 19, middle manager)

The interview data, in this respect, tends to self-portray the middle managers more as department advocates than civil service agents, and they wish to side with their department colleagues. Secondly, actor interviews express some clashes with teachers that tend to downplay discipline rules among the students. Very few, or next to none, conflict laden issues are associated with the relationships to the working life sphere. The informants report that when problematic situations related to job training emerge, they are rapidly put on the agenda.

8.9.6 Filling structural gaps from the middle

The current design of Beta is composed into a three-layer structure of formal authority. The school management team and the central office form the first layer. The third layer, at the operating level, is formed by the layer of core teams within each subject department. The middle layer is filled by the middle manager within his or her own subunit. The structure is thus deregulated at the middle level, and middle managers are therefore expected to fill these regulatory gaps with their personal interpretations, judgments and choices. This feature is due to the fact that several administrative functions have been downsized and delegated to the layers of middle managers, and in consequence, the top layer of the school hierarchy is relatively low-weighted. This also means that the middle managers as a group must also undertake some cross-departmental planning, negotiations, decision making, alignments and coordinative tasks.

The three middle managers are therefore allowed to make some coordinative plans in collaboration, and in that manner, they strongly influence, through their joint decisions, how rules should be understood and practiced within their subunits. The latest version of the general tariff agreement for teachers arm the employer side with more freedom to more flexibly manage the work time resources of the teachers with the purpose of increasing cost-efficiency. Seen from the managerial stance, it is crucial to ensure economic benefits out of this formal agreement, and this responsibility is delegated to the middle manager. When the framework is utilized optimally, substitute teaching costs are kept at a minimum, and it is up to the middle managers to utilize the tariff agreement to the best of the school's interests. From this perspective, the middle managers are expected to act as agents on behalf of the school owner. Held together, middle managers in their daily practices fill a series of regulatory gaps between top management and the core teams.

8.10 Integrating the elements

8.10.1 A tailored learning structure

Beta exposes a close to similar distributed learning system as in the Alpha case. The image of a three-layer structure fairly well captures the building blocks identified. The layer of relatively autonomous teacher teams enables rapid adjustments in educational practices, when external feedback from the workplace justifies such actions. The occupation-bound network, alongside collegial forums at the subunit level, constitutes the other building blocks of

the system. I justify use of the term learning system first, because it is grounded on feedback mechanism that enables knowledge to be transferred and shared recursively across the school-workplace boundaries. Equally important, the system is utilized to create and maintain a commonly owned stock of knowledge that exerts substantial influence on both in-school instruction and on-the-job training of the recruits. The primary outcome of the learning system is a body of practice repertoire and training routines that are gradually shared on both sides of the school-working life boundaries. Thereby this shared body of knowledge contributes to adaptation at the subunit level of the school organization. A summary of the three-layer structure is shown in table 8.5.

Table 8.5: The learning system identified

COMPONENT	DESCRIPTIONS
Core team	<ul style="list-style-type: none"> • A micro context for adjusting teaching practices within a defined domain of responsibility for students • A context for sharing responsibility for demanding students • Adaptive context for meeting workplace demands
Subunit forum	<ul style="list-style-type: none"> • Alignment context for diffusion of experiences and information across teams
Occupation-bound network	<ul style="list-style-type: none"> • Integration of knowledge across school-workplace boundaries • Informal community for mutual adjustments of teaching and job-training • Informal community for shared enterprises • Commercial projects cultivator

Similar to the previous sub-case, the distributed learning system identified is a combinative structure built on both formal and informal elements. Moreover, also in line with the previous narrative, the elements to a large extent are bound together by middle management practices: Connecting workplace actors and teacher colleagues tighter together, mobilizing additional resources when possible and raising issues from different contexts on the various agenda accessible. The descriptive data portrays a role of a hands-on agent close to action, a facilitator at hand for teamwork and a social network cultivator.

8.10.2 Extended middle management role

Following the line of argument above, a following descriptive account emerges from the data, summarized in table 8.6.

Table 8.6: Integrating functions of middle management

FUNCTION	DESCRIPTIONS
Negotiating interests and views within teams	<ul style="list-style-type: none"> • Negotiations between conflicting views and interests within teacher teams • Negotiations within the SMT
Proposing initiatives	<ul style="list-style-type: none"> • Utilization of information, knowledge and critical experiences, in order to come up with proposals and ideas from one location to another • Utilization of knowledge from one location into agendas within another
Communicating experience between teams	<ul style="list-style-type: none"> • Derives from the formal role of department head • Translating and bringing up experiences, proposals and ideas from one team practice to a setting where all teams participate
Facilitating team practices	<ul style="list-style-type: none"> • Helping teachers to master team collaboration, solving problems or allocating resources
Intervention in team work	<ul style="list-style-type: none"> • Intervention in team work based on own perceptions and judgments
Connecting colleagues to working life stakeholders	<ul style="list-style-type: none"> • Utilization of social ties to the external working life to establish links between teachers and workers • Systematic connections of the operating units of the school with external milieus
Mobilization of resources	<ul style="list-style-type: none"> • Formal and informal access to resource pools • Liaising on behalf of his or hers own domain, in order to mobilize extra surplus of resources
Filling gaps	<ul style="list-style-type: none"> • Filling gaps from the middle through self-managing authorities of tariff agreement practices

The descriptions specified in the table above are all under-communicated in formal task descriptions and functional accounts in the organization chart of the school.

8.10.3 Problem based learning cycle

Similar to the previous case, the data portrays a learning cycle of various forms of integrative learning, within teams, across teams and in projects and summits housed by the occupational networks. A shared practice repertoire is also discernable, encompassing teamwork, subunit agendas and collaborative patterns of the social network. In contrast to Alpha, the descriptions of dissonance are not so strong, probably due to a higher level of acceptance for difficult situations related to demanding students. However, at the same time, the data leaves no doubt that learning is problem-based, initiated to create a best possible match between schoolwork and workplace training for the students, and aiming to socialize as many as possible into apprenticeship.

8.10.4 Loose coupling

The learning structure identified can fairly well be understood as a loosely coupled micro-system, although the pattern also exposes a simultaneous loosely and tightly coupled pattern of interaction. *Firstly*, the team practice implies per se a case of temporal decoupling from centralized organizational routines. Within a significant time interval, the teams are empowered to self-manage their own microstructures of instructional management. At the same time, teamwork per se couples the individual work of the teacher, at least in principal, tighter to a closely-knit group of teacher colleagues. Compulsory participation and formal restrictions are power means in that sense. *Secondly*, as the identified structure is bound to distinctive occupational knowledge domains, the boundaries between the subunits are strict in practical life.

Through network engagements, joint projects and informal endeavors, tighter couplings between school professionals and external stakeholders are established. Consequently, the learning structure portrays a adaptive system that on one hand is loosely coupled to the central hierarchy of the school. On the other, it represents improved couplings to the external world, paired with de-privatization of the teacher's work. Furthermore, the case points uniformly to the inference that adaptive learning is a local phenomenon, in this case departing from the subunit level. However, different from the previous sub-case, a series of formal authorities are deliberately underspecified in the formal school structure and left to the individual or collective judgments of middle managers. This is the case in tariff agreement issues as well as in a series of coordinative tasks. In those cases, middle managers may define micro-policies in practice in the technical core. It

emerges as effective from the data, but the pattern nevertheless, amplifies loose coupling.

8.11 Summary

The descriptive narrative of the Beta site portrays a fairly successful school when it comes to adaptive capacity. All occupational lines operate under a challenging intake regime, characterized by a heterogeneous student population that is over-weighted in the problematic quadrilles, both in cognitive and behavioral terms. The role of assembly unit for less advantageous recruits from social institutions and other upper secondary school amplifies this picture. Similar to the Alpha case, inclusiveness is not only deliberately chosen school policy, but is also anchored in broad cultural norms represented in the two sub-cultures that constitute the institutional basis of the school. Despite a problematic recruitment context, the case study describes a fairly successful balancing act of adaptability to workplace demands and expectations.

Major adaptive instruments are a three layer learning system, in principle similar to the one identified in the Alpha data, but differences are also discernable. Compared to the Alpha case, the core team technology is far less sophisticated, in terms of well-developed frameworks and formalized tools that guide teams under various situations. Team collaboration is more informally grounded, although the component of the team practice is close to similar. On the other hand, the social networks with the external businesses and workplaces are more advanced and extensive. So is also the outer belt of relationships to cooperative partners in the industries and branches. Although the dominant categories, or components, of the learning system differ to some extent, they are utilized in a similar pattern.

Middle management roles are extensive under this form of 'full complexity'. In addition to mainstream responsibilities of middle management in school organizations, middle managers of Beta are extensive cultivators of social network ties and initiators of commercial projects. They thereby create extra socialization arenas for students that doubtless must help the enterprise of incubating them to fit workplace standards of behavior. Similar to the Alpha case, middle managers engage intensely in team-based issues and relationships, both within teams and between them at the subunit level. However, different from the previous sub-case, the middle managers of the Beta site also fill regulatory gaps on an independent basis, both individually and as a cooperative group. They thereby exert strong extra downwards

influence, because they, so to speak, possess the defining power in certain routine areas.

The observations made in the Beta site are more silent about dissonances related to internal complexity and external dependency. The actors utilize the formal and informal system mentioned as a context for problem based learning, but the interviewees do not express such strong perceptions of dissonance. Nevertheless, the adaptation cycle employed in action exposes problem based learning, although dissonance is not a dominant category. This could be explained by stronger social ties to the workplaces, more dense collaboration and a stronger identity when it comes to acceptance for working with disadvantaged students.

Chapter 9: Analysis of middle management practices

9.1 Introduction

Chapter 9 represents a shift from descriptive narratives to conceptual ordering of the findings in the light of theory. This final part of the thesis, thus, aims to match the reported evidence with the central concepts of the theory section. This analytical operation, labeled ‘retroduction’ (Ragin, 1994a) is a critical part of the research process. The theory-evidence dialogue is structured into a labor division of two separate chapters. In the next chapter, the adaptive learning mechanism, i.e. the distributed structure and its situated learning process, is analyzed in the light of the theoretical framework. This present chapter then aims to analyze the practices, through which middle managers of vocational training contribute to local adaptation. The purpose of this present chapter is, thus, to pull together and conceptually order the middle management categories, as rooted in the descriptive narratives.

The descriptive data provides evidence of middle management in transition within the vocational training field. Specifically, the team technology at the ‘street level’ of the organization, alongside extensive network engagements, brought about significant extensions and adjustments in the middle managers’ work role. Since adaptive learning in this context is distributed in its nature and thereby only weakly interconnected, connectivity, boundary spanning and brokerage have become key functions undertaken by the middle managers. The chapter starts with the analysis of the middle manager’s work context, clustered round the umbrella concept of loose coupling. Thereafter, the chapter conceptually orders the role dimensions of middle management as they are presented in the descriptive data. The notion of the *knowledge broker* is used as an umbrella concept in organizing the categories.

9.2 The loosely coupled vocational school

The term loose coupling is a sensitizing concept (Rowan, 2002b, p. 607) used to describe connections between organizational elements, as well as social mechanisms, such as decoupled classrooms. The observation of loose couplings in school organizations is, as underscored by Orton & Weick (1990), only valuable as a starting point, not ‘the end of the story’. The observation of loose couplings informs neither policy makers nor school managers about how to pursue school improvements (Fusarelli, 2002). The

value of the concept rather lies in its capacity to map the complex work context of school practitioners, and thereby indirectly, contribute in identifying possible response strategies that may be useful.

The descriptive data confirms multiple forms of loose couplings embedded in the work context of middle managers and their teachers. *Firstly*, the distributed curriculum itself portrays disconnected curriculum components and activities, cognitive distance between dispersed actors as well as asymmetric distribution of power and resources. *Secondly*, the school design is shaped by the highly specialized occupational domains, which are demarked by distinct knowledge boundaries. Middle managers therefore, at least to some extent, work as autonomous ‘corporate agents’ within their subunit domains (Briggs, 2005, p. 34). *Thirdly*, loose couplings also arise from the internal complexities involved in classroom instruction. In consequence, boundary-spanning roles become crucial, in order to effectively manage this stream of loose couplings from the middle line of the school hierarchy.

9.2.1 Loose coupling in the distributed curriculum

As laid out in chapter six, a major category of the loose coupling phenomenon is represented by the internal structure of the distributed curriculum. The analysis suggests the curriculum represents an extreme case of loose coupling in education. *Firstly*, the juridical guarantee ensured by the intake regime is disconnected from the logic of the training curriculum. When a young student is enrolled into a vocational foundation course, it is impossible to guarantee that the student will gain the opportunity to complete the four-year training program. Moreover, this situation may also be independent of the achievements. A student may achieve top grades in all subjects, but risks rejection in the apprenticeship market due to lack of positions. Hence, the pattern reflects a disconnection between elements that are regulated by the same educational legislation. In other words, input may be disconnected from the final output, and cause may thus be disconnected from its effects (March, 1994a; Weick, 2001).

Secondly, the main activities of the vocational training program are disconnected from each other. The activities of in-schooling and job training are discrete, and they take place in distinctively different social locations, i.e. classrooms and real life workplaces. The two main elements are disconnected in structural terms. The training pattern itself is therefore distributed in its nature, and its shape is closer to a provider chain than a program of education. *Thirdly* and nested, the curriculum is embedded in an

asymmetric distribution of critical resources and powers, which in itself is an origin of loose coupling. A *fourth* origin of loose coupling in the training curriculum is the presence of cognitive distance between the actors involved. Cognitive distance denotes that the work of the involved actors is guided and informed by frames of references that to some extent are divergent, or even incompatible (Lane & Lubatkin, 1998). For example, in businesses and public service production units, work attitudes, intensity of efforts, customer empathy, client care and collaborative behavior are central competence fractions. These components are generally not preferred didactical components of current school curricula, as underscored by the informants. There is for example a strong tradition that subject grades are premium, whereas the workplaces do not put similar emphasis on this aspect above a satisfactory level¹⁰⁵.

9.2.2 Loose couplings shaped by internal fragmentation

A signature characteristic of the loosely coupled educational organization is internal diversity and fragmentation. A well-described property of schools is therefore lack of, or at least extremely weak, horizontal coordination between subunits, as well as between programs within the same subunit. Weak connections between the top apex and the professional subunits are also described as a hallmark of the professional bureaucracy (Mintzberg, 1993). The descriptive data supports the image of internal fragmentation, and thereby loose couplings, as a stable feature of Norwegian upper secondary schools. The subunits represent distinct branch specific knowledge domains, mirroring occupations in the external working life.

For example, teachers in electrical trade typically engage in relationships with the electrical trade businesses in the external working life. On the contrary, they will typically have less frequent interactions with some of their neighbor subunits, where for example hairdressers and stylists are trained. There are, as such, relatively clear demarcations between the internal subunits of the school. Even within a single subunit, internal diversity is found. In the Beta case, the department of Healthcare and Social Services houses several specialized training programs, where the target areas of the working life vary from kindergartens to the businesses of foot-therapists and

¹⁰⁵ This means, grades must be satisfactorily, but variation above satisfactory level is not equally valued. Workplace decision makers put more emphasis on absence, work behavior, collaboration and work-related attitudes, and these differences expose some cognitive distance between the core logics of schooling (Markussen & Sandberg, 2005).

apothems. Large within-subunit diversity can therefore be expected. Due to these frame conditions, even a pure vocational school is a loosely coupled organizational system.

9.2.3 Loose couplings as a function of internal complexity

Furthermore, the descriptive data reveals that internal complexity in classroom interactions also turn out to be a stable source of loose coupling. Internal complexity in this setting denotes the range of different considerations that must be made and dealt with by the teachers in classroom work due to heterogeneity and diversity in student capabilities. The two sub-cases expose a wide range of difficult cases that teachers have to take into account in their didactical consideration, due to many students with disabilities and special needs. The theoretical point is that this pattern shapes and reshapes loose couplings in the classroom technology. Especially manifest in the special education department in the Beta case are a series of individually tailored educational programs, which produce complexity in both structure and work interactions. Besides the coordinative challenges, these tasks involve negotiation with teachers and liaising for external surplus of resources. The middle managers describe a need for daily facilitations and negotiations with teachers, due to diverse and complex classroom conditions.

9.2.4 The dialectical nature – tangled couplings

A dialectical approach means in theory that an organizational system is not entirely loosely coupled across all units. Some part of the organizational system of the school might be loosely coupled, whereas others may not be. However, the dialectical approach, as introduced by Karl E. Weick in 1976, also implies that tight and loose couplings may co-exist simultaneously within the same organizational unit. The data provides some specified descriptive accounts, most strikingly explicated in the team based subunit design, that support this theoretical argument. When all subject departments in both sites were fragmented into team layers, this in itself represents a looser coupling to the school's organizational structure. Establishing work groups or teams does not per se mean looser coupling, because it is possible to couple work groups tightly to hierarchies and standard operating procedures. The looser coupling argument comes rather from the large amount of empowerment attached to the teams (Somech, 2005). In both sub-

cases, the teams may, based on their own judgments, decouple their own didactical model, internal labor division and design of tasks from the centralized timetable routines in certain periods of time. Besides, within each of the subunits, the coupling between the teams is rather loose, due to their self-managing work technology. As such, there is no structural mechanism that binds team practices together simply because this would collide with the idea of self-managing teams. On the other hand, the work context of the teacher is more steered than earlier through the team's work technology. The team practice, thus, represents a case of partial decoupling from the organization structure, and, at the same time, tighter couplings of teachers and students to a self-managing team technology. In other words, loose and tight coupling co-exist, literally 'side by side', and this observation supports the dialectical notion.

A second case of co-existence of tight and loose couplings in the same area is demonstrated by the external relationships. When teachers and middle managers form relationships to their outside stakeholders, their negotiated solutions represents per se a case of looser coupling to the administrative structure of the school. At the same time, they tighten the couplings to their external stakeholders, through shared practices and networking. Brian Rowan suggests to use the metaphor 'tangled coupling' to describe such mix-coupled systems (Rowan, 2002b). The term helps to shift the focus from the misunderstood dichotomy of tight versus loose coupling towards a tangled web of couplings. The interesting point is, furthermore, how school leaders can manage this "tangled web of sometimes incompatible and conflicting couplings" (Rowan, 2002b, p. 610). In this respect, the data particularly highlights boundary spanning and brokerage repertoires performed by middle managers.

9.3 The boundary spanning middle manager

When an organizational system depends heavily on its technical environments, boundary spanning performed by individuals is a key function for survival, or at least effective adaptive behavior (Schwab et al., 1985). In a market driven environment, individual boundary spanners are important agents through their horizontal relationships with their customers and business allies. Yet, the argument also finds strong resonance in the case study, exposed empirically by the strong dependency between school subunits and external workplace domains. Aiming to sustain a satisfactory fit between school repertoires and imposed demands from stakeholders, it is important for each knowledge domain to activate individual boundary spanners continuously. As laid out in chapters seven and eight, middle

managers are members in a wide range of functionally defined units of the school's organization chart: School management team, core teams of teachers, department meeting and subunit forums. Besides, the middle manager keeps regular meetings with contact teachers and the workplaces involved in the training of the subject department. This line of responsibilities also includes a series of high frequency meetings with working life bodies of branches and industries, as well as with civil service representatives.

The descriptive data of the case study confirms the image of middle managers of schooling as boundary spanners. Moreover, the findings expose that middle managers of vocational training are extensive boundary spanners, due to their large web of 'tangled couplings' they must deal with. The evidence shows that they strengthen their boundary spanning devices by network engagements, and network membership and engagements emerge as a stable pattern. The theoretical point inferred from the descriptive data is that utilization of boundary spanning opportunities and, in concert with, network engagement, support each other mutually as integrative mechanism. The data analysis therefore supports the notion that boundary-spanning opportunities are the key foundation of positive influence on local adaptation.

9.4 The knowledge broker role

In order to construct a typology that includes all sides of middle management practices in this 'mix-coupled' (Rowan, 2002b) context, an extended umbrella construct is required. Etienne Wenger's (1998) notion of the knowledge broker was chosen, because it captures both boundary spanning, networking as well as intense within-group engagements¹⁰⁶. The rationale of knowledge brokering is that cross-boundary interactions can "provide opportunities for learning to occur, and allow the organization to develop collective, coherent, synergistic knowledge out of potentially separate, independent contributions" (J. S. Brown & Duguid, 1998, p. 97).

¹⁰⁶ Wenger (1998) uses the term knowledge broker as an umbrella concept. Underlying categories of his broker role are 'translator', 'boundary spanner', 'pair' 'roamer' and 'outpost'. Wenger's (1998) argument is that the broker role is multi-faceted, and the categories cover different situational aspects of this complex role. Cillo (2005) suggests, in a similar vein, a model of four categories of the knowledge broker role, determined by cognitive distance and complexity of the knowledge involved. The data analysis follows the methodological aspects of the arguments posed by both authors.

Besides, the broker also promotes within-group learning through active engagements and negotiations within the focal group of practitioners (Wenger, 1998, p. 109). It is, as such, a strong multi-facetted role, which requires that the broker must ‘take his own medicine’, face the consequences of his work (Wenger, 1998). The term is therefore more wide-reaching in scope, applicability and intensity than the boundary spanner concept, although boundary spanning is the knowledge broker’s social foundation (Pawlowski & Robey, 2004). From the data analysis, four overarching dimensions of the knowledge broker role of middle managers arise. Descriptions of the categories are presented in table 9.1.

Table 9.1: Dimensions of the middle manager’s knowledge broker role

DIMENSION	DESCRIPTION
Translator	<ul style="list-style-type: none"> • Bridging perspectives, knowledge and information from different social contexts • Reducing cognitive distance • Cultivating learning dyads across boundaries
Liaison	<ul style="list-style-type: none"> • Seeking to utilize external opportunities • Community building across boundaries • Connecting external stakeholders with departmental colleagues • Social network agent
Facilitator	<ul style="list-style-type: none"> • A within-team role of helping teacher colleagues to deal with issues and to make sense of conflicting situations • Sustaining momentum in team work • Critical friend, supervisor and advisor • Stewardship, by focusing on the vocational line’s contribution to wider occupational field • Taking quality initiatives through projects with workplace stakeholders
Transformer	<ul style="list-style-type: none"> • Active participation in decision making, problem solving and practical solutions within teams • Based on perceived needs for intervention • Hands on engagement and championing • Negotiation solutions and compromises which also involves allocating resources • A transactional mode of leadership

The idea of conceptualizing this multi-facetted role of middle management by the knowledge broker concept emerged from the analysis of the

descriptive data, contested with the theoretical framework as presented in chapter three. The essence of the data analysis shows, furthermore, that middle managers utilize the various devices or dimensions of the knowledge broker role in different social arenas involved in their work. Besides, since middle managers are close to action of the schoolteachers, they may facilitate adaptation through creating learning conditions, as well as employing a more transactional repertoire (Harris, 2000).

9.4.1 The translator dimension

The term *translator* covers a major account of the middle manager's knowledge brokering repertoire. The case study portrays the middle manager as a boundary-spanning agent who is capable of supporting knowledge transfer across internal or external school boundaries. The decisive point is the middle manager's capacity to *re-frame* divergent perspectives from a source context to the one of the recipient (Lane & Lubatkin, 1998). Implicitly, the translator contributes to social acceptance, appropriateness and meaning at the recipient unit. As such, the translator dimension is based upon the utilization of boundary spanning opportunities, in order to promote collective meaning. As a translator, the middle manager can be seen as a 'carrier of knowledge'¹⁰⁷ that 'moves' aims, objectives, information and knowledge across a range of social locations, simply by shifting work context and operational territory.

The evidence drawn from the case study describes different facets of translator work as a vigilant part of the middle manager's work: Within teams, between teams and in network relationships with external parties. The use of the translator concept in this study therefore captures a series of activities undertaken by middle managers in different dyadic relationships: From the school management team to a focal teacher team, from a neighbor team to the same focal team, and from workplace partners to the recipient teacher team. The descriptive data underscores that translation practices by middle managers are also crucial for the alignment of team practices within subject department forums. Experiential learning between social groups, i.e. teacher teams, is a difficult enterprise, because it refers to transfer of situated and embedded knowledge that must be de-embedded from one context and re-embedded into another (Bechky, 2003). A summary of the facets of the translator dimension is presented in table 9.2.

¹⁰⁷ Wenger (1998) uses the term 'roamer' about this role dimension

Table 9.2: Facets of the translator dimension

TRANSLATION LABEL	DESCRIPTION
Internal diplomat	<ul style="list-style-type: none"> • Perspectives from the leadership team introduced to teacher teams in order to gain acceptance for more wide-reaching perspectives
Negotiator of meaning and understanding	<ul style="list-style-type: none"> • Implanting information about the terms of reference, problems and educational and organizational logics that both parties in the training chain have to take into account.
Spokesman of best practice	<ul style="list-style-type: none"> • Introduces practices, solutions or experiences from a team on the subunit agenda • Aims to activate experiential learning between teams
Policy coder	<ul style="list-style-type: none"> • Editing, recoding and selection of materials from reform documents, curricula and other policy sources
Mediator	<ul style="list-style-type: none"> • Constructing compromises at the subunit level in a way that make them practical and acceptable within their area, for example in projects
Outpost	<ul style="list-style-type: none"> • Workplace perceptions about the students' deliveries is systematically scanned and mapped in the workplaces and put on the agendas of team meeting and subunit meetings

The complexity of the translator role is determined by the need for expertise, trust and professional legitimacy on both sides of the dyad involved. The activities are multi-directionally shaped, since the middle managers translate in both directions. However, translation is also a multi level function. Shifting from the team context to the subunit level must account for some cognitive distance between the participants, simply because teams have created their own unique repertoires. In social network engagements with external parties, the translation dimension is important for facilitating the creation of shared understandings among the network actors.

9.4.2 The liaison dimension

The descriptive narratives describe a wide range of middle management activities targeting workplace stakeholders. The aim of this engagement is to improve the conditions for the students' training. This form of boundary spanning activity, accordingly, encompasses mobilization of external resources at the school's disposal. The *liaison* term is used to categorize this set of purposeful activities on behalf of the subunit, in which the middle manager serves his or her duties. Liaison involves an understanding of the systems and communication routes of the organization, as well as skills in negotiation with groups and individuals (Briggs, 2005, p. 39). Liaison is a representative corporate role, by which the middle manager negotiates with external stakeholders on behalf of his subject department.

The dominant form of the liaison dimension is about managing lateral relationships. Middle managers seek information, knowledge and resources in the local working life environments, which depends on precise understanding of communication routes, the utilization of personal relationships as well as the manager's access to agendas among workplace partners. Thereafter, the middle manager is in a premium position with access to teacher teams and subunit forums, as well as to individual teacher appraisals. Middle managers, thus, carry out liaising activities in both directions, - from the school territory across the boundaries to the stakeholders in the workplaces, and vice versa.

What the data, furthermore underscores, is the significance of frequent network interactions and thereby a central position held by middle managers. Although actor centrality is not measured in quantitative terms, the descriptive accounts provide sufficient evidence to conclude that the middle managers of the two samples operate a large number of strong ties and communicational links with their stakeholders: Workplace managers, instructors, representatives of associate bodies and cooperative organizations and civil servants. Middle managers of the sites are central actors, seen from the position of their operational territory. Through the utilization of their formal authorities, boundary spanning opportunities and extensive network engagements, the middle managers undertake extensive liaison work. Description of the liaison dimension is presented in table 9.3.

Table 9.3: Specification of the liaison role dimension

LIAISON LABELS	DESCRIPTION
Central actor	<ul style="list-style-type: none"> • Membership in occupational networks that provides access to reservoirs of various resources: Contacts, political support, projects, externally funded contracts • Central actors in networks bound to occupational environments • The liaison uses the capacity to mobilize critical resources to the subunit community through the activation and cultivation of strong professional ties
Ambassador	<ul style="list-style-type: none"> • The role involves a certain capacity of managing political processes, such as negotiation, bargaining and proposing compromises • Activities for gaining political support among trade unions, associated bodies, official branch offices and cooperative agencies

As suggested, the liaison role also activates a political repertoire, because it refers to the search for and mobilization of resources. This may be the case when the middle managers take part in external negotiation for contracts and project bids, aiming to ensure increased in-flow of resources. Grounded on the case analysis, the thesis shows that the three dimensions of knowledge brokering undertaken by middle managers constitute a critical function. The ‘ambassador’ metaphor is used to label the political sides of the liaison dimension (Ancona & Caldwell, 1992).

9.4.3 The facilitator dimension

The descriptive data also demonstrates that middle managers play a central role as facilitators, especially occurring within the teacher teams. Triggers of facilitation practices are recurrent problematic situations related to students, cases of which teams struggle to make sense, and to which they strive to find appropriate operative solutions. The facilitator dimension conceptualizes a range of responses to this stream of daily challenges. *Firstly*, the typical situation is described as ‘being called for’, in order to help team members in

problem solving, as well coming up with ideas. Dealing with difficult student cases is a recurrent theme, where middle managers participate in teamwork as facilitators. This category of situations is close to the notion of sense-giving as presented in the review of chapter three (Balogun, 2003; Balogun & Johnson, 2004). Facilitation also consumes a substantial amount of time, as described by middle managers, when team members strive with mastering the team technology, for example due to intra-group conflicts.

Secondly, the middle managers have access to all sides involved in the vocational training chain: Teacher teams, workplaces, all subject department forums along with a range of external associative partners. They may therefore serve as reservoirs of solutions, ideas and learning cases. In this sense, they work as enablers of learning conditions and providers of safe havens for trials and experimental learning (Floyd & Wooldridge, 1997). *Thirdly*, the data shows a stream of examples of middle managers engaging in project formation that facilitate learning among their professional colleagues. Especially within the industrially oriented subunits, e.g. electrical trades, processing industries, motor mechanics and construction, the middle managers are engaged in project formation. Ranges of quality initiatives may materialize through engagements in inter-organizational projects rooted in their training domain.

Both sites expose exemplary cases of projects and business enterprises that offer 'fledge opportunities for learning' (Balogun & Johnson, 2004). The role of the facilitator is more in line with a supportive agent than that of active intervener. It is a trust-based role in its original idea, more like an advisor or a supervisor, where the point is to provide collegial support and generate proactive solutions by stimulating creativity, solving of conflicts, problem solving and activating proactive strategies through enabling people to mobilize their own resources. Amplifying good practices is an important part of the facilitator role dimension as well. Specification of the facilitator dimension is shown in table 9.4.

Table 9.4: The facilitator dimension

FACILITATOR LABEL	DESCRIPTIONS
Facilitator of learning conditions	<ul style="list-style-type: none"> • Helping teams to improve their team practice through information about available sources • Empowering teams to develop their own repertoires of action • Creating 'safe havens' for experimental learning based on trials through justifying proposals
Sense-giver	<ul style="list-style-type: none"> • Helping teams and their members to makes sense out of confusing and complex situations • Suggesting solution that the team members can further develop and test in practices • Helping teachers to de-abstract and grow knowledge about team technology
Supervisor	<ul style="list-style-type: none"> • Supervision close to their actions and problems related to student cases • Supporting good practices within teams, by recommending to continue to build on the certain practices
Project initiatives	<ul style="list-style-type: none"> • Formation of projects that fledge opportunities for learning (Balogun & Johnson, 2004)

9.4.4 The transformer dimension

A well-described account drawn from interviews with the middle managers refers to more direct 'hands-on' engagement in the negotiations within the teams. The data describes a range of recurring situations that call for active negotiations, interference and interventions, based on the middle manager's own perceptions and judgments. When the middle manager perceives that teachers or teams perform their work ineffectively, off direction or deviant from prior decisions, he or she has the formal authority to intervene in teamwork. I have used the label transformer about this function. The role is complex and double-edged, since it implies negotiation between conflicting interests. This is far from a conflict-free zone, and the transformer must engage in many conflicting situations related to recurrent dilemmas and

incompatible interests. It describes a more transactional leadership style¹⁰⁸ interfering in group processes, which also involves some degree of power and influence. The transformer dimension is specified in table 9.5 below.

Table 9.5: The transformer dimension

TRANSFORMER LABEL	DESCRIPTIONS
Transformer	<ul style="list-style-type: none"> • The transformer directly negotiates adjustments of didactical conditions in teams • Inference due to negative performance feedback from students or workplace stakeholders • Engagement with the team members involves the use of power and “hands on” influence • Transformer practices take place due to interventions and ad hoc situations • Conflict management is a substantial part of the transformer’s work

Compared with the translator, the transformer dimension represents a more intense mode of knowledge brokering. Nevertheless, the joint contribution from the translator and transformer dimensions may exert positive influence on the process of integration of knowledge and bringing cohesiveness to the teamwork. Both dimensions are combinable and overlap, at the same time as they represent different levels of brokering intensity. The interviewees uniformly perceive their minor positions as teachers as important constituents for exerting such kind of influence on their teacher colleagues. Operational skills in teaching emerge as an enabling condition for gaining professional legitimacy and being sufficiently knowledgeable about the problems and challenges related to the teamwork¹⁰⁹.

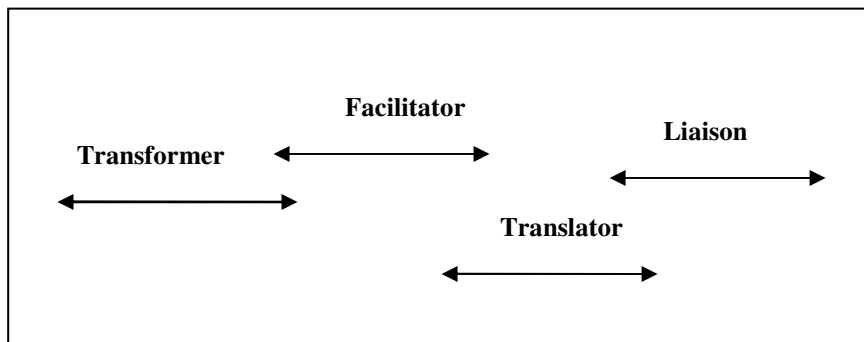
¹⁰⁸ Busher and Harris (1999, p. 307) argue that this direct broker function implies a transactional leadership style, because it utilizes the formal authority embedded in the structural position.

¹⁰⁹ Although Alma Harris and her colleagues did not use the label knowledge brokering in their seminal article about middle management in effective secondary school departments, the evidence predicts teaching skills as an important constituent of professional influence on their colleagues (Harris et al., 1995).

9.4.5 Overlapping dimensions

The four dimensions presented in the previous section are not entirely distinguishable from each other. The four dimensions are more like ‘qualitative scales’ (Berg, 1995b) which overlap to some extent. This point corresponds fairly well with the status of the theory, as reviewed in chapter three. The dimensions may also serve as analytical tools for ranging and ordering variation in intensity (Strauss & Corbin, 1998). This analytical property corresponds with how knowledge brokering occurs in practice - lots of variation in intensity through the middle managers’ daily micro practices. They are also combined in the daily practices of middle managers’ responses to complex situations. The translator and facilitator dimensions are also combinable in practices within teams, as is the transformer dimension. The overlapping nature of the identified knowledge broker dimensions is illustrated in figure 9.1.

Figure 9.1: The dimensions of the knowledge broker role



To sum up, the four role dimensions analytically capture the essence of the descriptive data about middle management in the loosely coupled context of vocational training. Although being suggestive and tentative in nature, the four dimensions represent as substantive finding drawn from the analysis.

9.5 Knowledge brokering as adaptive learning function

In addition to ordering the scope and complexity of the middle manager’s role within the given context, knowledge brokering also emerges as a

distinct function in the identified learning cycle. This analytical duality corresponds with the use of the concept in a range of published work. For example, the twin concepts of knowledge broker and knowledge brokering have been used to analyze the impact of IT professionals on practice learning among employees within firms (Pawlowski & Robey, 2004). The individual IT specialist is subsequently conceptualized as a knowledge broker, and the function of his or her activities is termed knowledge brokering. Another example is when marketing people within a firm codify external market knowledge and make it applicable for internal workers (Cillo, 2005). However, as demonstrated in chapter ten, adaptive learning is a complex and cyclical process that calls for multi-faceted modes of knowledge brokering. The thesis therefore, although based upon a small study sample, suggests that knowledge brokering is an important adaptive learning component in loosely coupled school organizations and under the current constraints and contingencies, knowledge brokering is demonstrated to be a key function of adaptive behavior. In this respect, middle managers are key actors of the learning cycle.

9.6 Summary of analysis

The metaphor 'tangled couplings' (Rowan, 2002b) fairly well captures the middle manager's work context, as it emerges from the descriptive case narratives. In line with the theoretical framework, loose coupling is seen as a multi-faceted concept (Orton & Weick, 1990), since it describes the internal as well as the external context of the middle managers fairly well (Rouleau, 2005). Both sites expose that even within a single subunit, the operational territory of a middle manager, a range of distinct occupational domains exist. The evidence has also shown that, due to a more heterogeneous student population, teachers must master a high level of complexity in classroom interactions. This feature also shapes loose couplings in the internal work context. Turning to the external context, the distributed curriculum of vocational training is in itself an extreme case of loose couplings in the technical core of education. How this web of tangled couplings is managed, emerges as a key function of local adaptation (Ogawa & Scribner, 2002).

As a result, boundary spanning is a key function of adaptive management behavior. The data analysis presents evidence of a wide range of boundary spanning opportunities embedded in the formal responsibilities of middle managers within this context. Wenger's (1998) term knowledge broker is used to capture the full range of the middle manager's boundary spanning

roles within the given context, and a typology of four main dimensions is suggested: Translator, liaison, facilitator and transformer. The two latter dimensions in particular underscore that knowledge broker is a more wide-reaching concept than boundary spanner. It also includes facilitation and practice engagements within teams. The foundation of knowledge brokering is boundary spanning, nevertheless, the broker's repertoire goes beyond the pure boundary spanning roles. The wider theoretical argument proposes that middle managers are uniquely positioned to play a premium role as knowledge broker, which in this study is primarily used to portray lateral influence. Whereas most of the existing literature on middle management, educational as well as non-educational, has focused on downwards and upwards influence, this study focuses on the lateral avenue: A recursive stream of information, knowledge, resources and support from the subunit and to the external working life environment, crossing indistinct boundaries, and vice versa.

Chapter 10: Analysis of adaptive learning

10.1 Introduction

The purpose of this chapter is to analyze conceptually the response strategies employed in order to deal with demands imposed from the environments. Since adaptive learning is an externally rooted process, a relatively precise understanding of the vocational school's external environments is required. The *first* section of the chapter therefore analyzes the external context and the imposed demands as emerge from the descriptive data. *Secondly*, the identified learning system, as described in chapters seven and eight, is analyzed in the light of the theoretical foundation in chapter four. The analysis suggests that the concept of a distributed community of practice (J. S. Brown & Duguid, 2001a, 2001b; Wenger et al., 2002) fits the empirical categories closely. The *third* part of the chapter analyzes the adaptive learning process situated in this genuine learning structure. Moreover, a locally shaped adaptive learning cycle is conceptualized as grounded on the descriptive case data.

10.2 Analysis of the school's external environments

The vocational training field is characterized by strong external dependency on stakeholders of the local working life environments. Accordingly, these external stakeholders exert significant influence on classroom conditions. Besides, the evidence brought up by the research shows that the intake regime of 1994 has exerted strong influence on the work context of teachers within vocational training. The result is a more complex core technology, paired with external dependency, which distinguishes this field significantly from academic schooling. The research also brings evidence that school actors show loyalty and obligations to inclusive norms of schooling, which are rooted in broader cultural pillars of the unified school institution. In aggregate, these conditions constitute multi-faceted, complex and diverse environments that sometimes impose conflicting demands and expectations on schooling. The descriptive data, thus, suggests a specification of multiple external demands rooted in distinguishable environmental spheres to which vocational training actors have to relate. When adding this observation to the identification of multiple loose couplings, as analyzed in chapter nine, it seems clear that vocational training institutions are differentiated systems operating in fragmented external environments.

10.2.1 Dependency on the local working life field

The most important domain of the vocational school's external environments is the local working life. Local subunits of vocational training belong to local organizational fields populated by players bound to a distinct occupational domain. The inter-organizational field model directs attention to a collection of heterogeneous organizational actors within a specific geographical area (Galaskiewicz, 1991). For example, school subunits, business firms, public institutions, branch associative bodies and civil service agency may form a field. The decisive point is not the collection itself, but rather that they are bound together through dependencies and a minimum level of interaction (Scott, 1992, p. 158). From this part of the school's external environments, demands are targeted towards the subunit level of the school organization. For example, if construction companies are dissatisfied with student behavior in job training, their managers communicate performance feedback directly to the head of the construction and building department of the school. As such, external relationships are handled at the 'street level' of the school. The realistic picture of the school's external boundaries is therefore the one of a series of micro-boundaries between each subunit and its occupational environments.

This occupation-bound organizational field hosts a web of interactions and relationships involved in vocational training. As elaborated in chapter nine, the distributed training curriculum is interpreted as an extreme form of loose coupling in education. The argument is supported by observations of discrete activities that are structurally disconnected. Among the dispersed actors involved, some level of cognitive distance is also expected. However, the distributed curriculum also exhibits another analytical property of crucial importance - external dependency. Due to asymmetric distributions of power, resources, critical knowledge and contacts, the role of the school side is reduced to the one of a subcontractor – at the starting point. The descriptive data shows that workplace stakeholders exert significant technical influence on their corresponding school actors through this asymmetric institutional arrangement.

The term *technical* implies that the externally imposed demands can relatively easily be defined, specified and understood among the involved parties (J. W. Meyer & Scott, 1992). In education, this means expected outcomes, i.e. behavioral and cognitive standards of the students. Technical instruments are typical assessment procedures and control instruments (Rowan & Miskel, 1999). Besides, technical influence may also be exerted through work process categories: Preferred pedagogical styles and teaching of preferred aspects of the curriculum. Work process demands become

technical when specified. As pointed to in the previous chapters, workplace stakeholders are uniquely positioned to assess the outcomes of their applicants for apprenticeship through the previous praxis rotation periods. Moreover, their demands may be guided by sanctions, simply by intake decisions. Demands imposed from this sphere of the school's external environments are thus difficult for school professionals to bypass or ignore, if the school is to succeed, or even survive, as a training institution.

10.2.2 Technical influence from the intake system

An additional source of significant technical influence on classroom conditions comes from the general intake regulations of Norwegian upper secondary education. Grouping of students in the classes is one of the strongest forms of technical influence, simply because grouping largely determines instructional conditions (Busher, 2006, p. 54). When, for example, the share of students with low cognitive and motivational capacity increases, or is maintained at a high level, the technical effects are substantial. Intake rules and preferred policies are, as such, strategic instruments with significant technical effects on classroom conditions. The descriptive data of chapter six reports a heterogeneous and challenging student population within vocational training as a whole, associated with severe progression and completion problems. The case study strongly supports this image and suggests that the problematic aspects of the intake system are most severe within vocational training.

A side effect of the fragmented environments that surround vocational training schools is lack of correspondence between input and output demands (Thompson, 2004, p. 27). For example, the regional governance system, which provides financial resources, typically focuses upon the input side of schooling. It is obliged to ensure all applicants, independent of their abilities, the opportunity of entering schooling in a preferred foundation course. Workplaces, in contrast, direct attention, inspection and assessment towards the output categories, i.e. cognitive, social and behavioral standards. Besides, the descriptive data also uniformly shows that workplaces have expectations and demands of the work process, i.e. preferred curriculum components and methods in use. Expectations from this diverse collection of stakeholders not surprisingly, may be of an inconsistent and incompatible nature.

10.2.3 Normative influence from the larger school institution

The case study shows that inclusiveness is a highly prioritized norm at both sites investigated. Inclusiveness refers both to intake policy deliberately chosen by the school management corps, as well as longstanding norms among the schoolteachers. In principle, intake of disadvantaged recruits could be rejected, or kept at a minimum level by the decision makers of the school. In contrast, the school management corps of both sites, supported by their professional milieus, has prioritized inclusive intakes of less capable applicants. Similar cultural traits are also manifest when it comes to willingness to provide tailored programs for students with special needs and social disabilities. Although the effects of inclusive practices lead to more challenging contexts, especially when it comes to the incubation of students into the workplaces, both sites prefer to maintain this policy. The cultural basis of both sites therefore *amplifies* the technical effects of the intake regime. The points above underscore that the vocational training school operates in fragmented environments, which expose the subunits to complex streams of external demands. Although the main stream of the demands imposed from these environments, is of a technical nature, institutional demands are also visible in the descriptive data. A summary of environmental characteristics is given in table 10.1.

Table 10.1: School environments and demands

ENVIRONMENT	DEMANDS	INSTRUMENT
Governance system	Technical control of input of schooling	Grouping of students, accompanied with resource allocation
Workplace environment structured in local fields	Technical control of output of schooling	Asymmetry in power and resources Assessment and sanctions
Normative basis of the unified school institution	Normative and cultural	Social influence from norms that have gained hegemony within the larger institution

10.2.4 Blurred boundaries

An important theoretical property exposed by descriptive data is the blurred nature of the external boundaries of the school subunits (DiPaolo & Tschannen-Moran, 2005). And following the argument of Busher: “These semi-permeable membranes allow for osmosis between a school and the local social and business communities in which state schools are deeply embedded” (Busher, 2006, p. 2). This conception of the boundaries sees schools more as purposeful communities tuned at socializing students into behaving in what dominant discourses in their host societies describe as socially appropriate. Thus, technical external demands from the workplaces find their way to school actors relatively easily, simply because the boundaries between the school department and workplaces are sensitive membranes. The other way around, school professionals also easily find their way to stakeholders in the local environments, through joint engagements, projects and membership in occupational associations. Flexible boundaries, as such, create favorable conditions for activating adaptive strategies in terms of community building, boundary spanning and joint interactions (Yan & Louis, 1999)..

10.3 Distributed community of practice as adaptive system

Adaptive learning therefore boils down to the appropriate absorption of working life demands in a manner that allows school actors to maintain inclusive school policy. The latter body of demands is rooted in regulatory obligations as well as strong professional norms. School managers, as strikingly described in both sub-cases, seek to act rationally through a balancing act, in order to meet partly incompatible external demands. The descriptive data shows that adaptation of instructional practices was matched with stakeholder demands through the institutionalization of a practice-based repertoire. Moreover, this shared practice connects the technical core of the school with its most influential stakeholders in the environments. The restructured team layer made it possible to make rapid adjustments in the didactical routines, and when the team technology is connected with stakeholders through social ties, a distinct learning system emerges. Accordingly, the analytical inference emerging from the descriptive data sees this distributed system as the decisive component of local adaptation.

10.3.1 Distributed community of practice

The major theoretical argument is therefore that a team-based technical core alongside an external network constitutes a distributed community of practice. The decisive point for classifying this social micro-system as a community of practice is, *firstly*, that this genuine learning structure enables recursive osmosis of knowledge, performance feedback, initiatives and resources across school-workplace boundaries. *Secondly*, the system is practice-based because it hosts learning frameworks that govern the work of the individual teachers, at the same time as it exerts influence on job-training conditions at the workplaces. The theory review in chapter four shows that a distributed community is specified by a ‘chunk’ of discrete work components that are bound together by the shared practice that emerges from regular interactions among disperse members (Duguid, 2005). This structure provides a flexible and adaptive learning system, that enables the integration of knowledge across boundaries, and, secondly, it stimulates mutual adjustments among workers and schoolteachers. The basic categories are presented in table 10.2.

Table 10.2: The distributed community of practice

PROPERTIES	DESCRIPTIONS
Actors (members)	<ul style="list-style-type: none"> • School teacher teams within a distinct knowledge domain of a subunit • Workers and instructors of the corresponding working life field • Middle managers and workplace representatives
Knowledge domain	<ul style="list-style-type: none"> • A distinct school domain of subject knowledge corresponding to an occupational branch
Constituents of a shared practice	<ul style="list-style-type: none"> • Shared sense of purpose and understanding of didactical conditions • Shared frameworks for improving student socialization • Enterprises and projects of mutual benefits
Integration mechanism	<ul style="list-style-type: none"> • Social ties between school professionals and stakeholders • Joint projects that unite the actors • Knowledge brokering devices

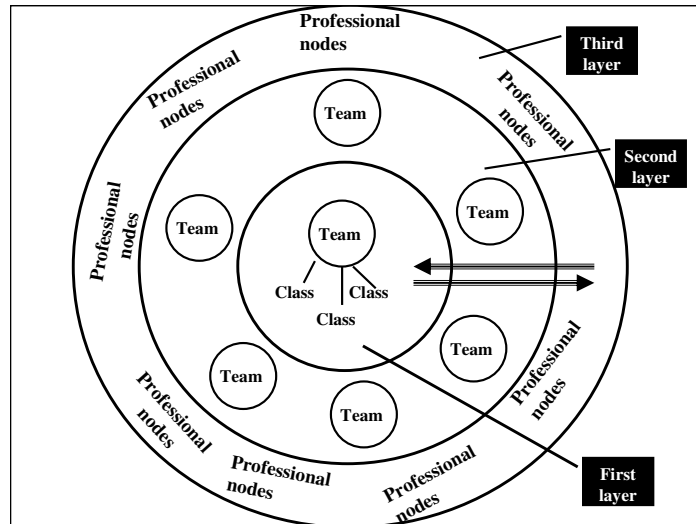
The distributed community of practice¹¹⁰, thus, represents a unique combination of discrete activities carried out on both sides of the school-workplace boundary. These discrete activities are grounded on some degree of shared sense of purpose, although they occur in different locations. Besides, the discrete pieces are bound together by an additional social organization, a social network. Social ties, grounded on occupational competence, and cultivated through a series of joint projects, bridge teachers and school managers with external key actors. As the interactions spans organizational boundaries between the school and workplace institutions, a potential context for mutual adjustments is created. The community, so to speak, connects the technical core of the school with its surrounding environments in the working life. Consequently, it is the distributed nature that makes it a promising ‘engine room’ for mutual adaptation. The distributed community, therefore, is the ‘host’ for the institutionalization of school subunits as local adaptive learning systems.

10.3.2 The three layer community structure

Its distributed nature is first reflected in the internal community structure. I use the image of three ‘layers’ as an analytical narrative in order to capture these empirical properties. Teacher teams that reside within each of the subunits fill the inner ‘layer’. The members of the teacher teams also operate at the level of interaction that I have characterized as the second ‘layer’. This ‘layer’ overlaps with the functional unit of the subject department. The second ‘layer’ plays a crucial role for diffusion of experiences between teams, which is a complex and difficult learning process (Bechky, 2003; Orlikowski, 1998, 2002; Scarbrough et al., 2004). The two ‘layers’ represent two levels of interaction that are bound together by overlapping participation. The third ‘layer’ is a social network that unites schoolteachers and school managers with their working life partners. The social network adds a boundary-spanning component to the community structure, and it connects the workplace stakeholders to the technical core of the school organization through social ties. An illustrative model is shown in figure 10.1.

¹¹⁰ In the research literature, most examples of distributed communities of practice are so-called “virtual” communities, where the actors do not meet on a daily basis (J. S. Brown & Duguid, 2001a, 2001b; Wenger, 2000; Wenger et al., 2002). The conceptual properties are, however, transferable to the case subject to investigation

Figure 10.1: The three layer structure



The team context enables the integration of members' individual knowledge into a team repertoire that supports, improves and guides their instruction (Crossan et al., 1999). Moreover, the team layer couples students and teachers together through a local routine and a microstructure. The team is therefore the most decisive adaptive learning unit, armed with a high degree of control over the activities of a defined number of classes and students. Besides, the teams control a pool of human resources, in terms of the teachers' work duties. This layer may compensate for the agent problem of isolated teaching through structural control, i.e. compulsory membership and participation. The high degree of interdependency and 'shared fate', alongside control over resources, tighten the coupling in the production core of schooling. On the other hand, the large amount of empowerment inherent in the team technology loosens the couplings to the central hierarchy. The second 'layer' plays an important role in alignment of practices. The second layer is the playground for diffusing team repertoires in an enlarged setting. The inherent purpose is reduction of unintended variability between teams, alignment of routine elements and procedures as well as mobilizing attention towards joint challenges. Furthermore, the second 'layer' is a looser context that is utilized to share experiences and to transfer good solutions and ideas from one team to another.

The third 'layer', the external relationships, is *firstly* characterized by strong ties of frequent interactions among the members. The actors meet regularly and are bound through a series of institutionalized collaborative activities. *Secondly*, it is a dense network, characterized by a range of joint projects, joint activities and common meeting places. Density denotes that the professionals collaborate about many "enterprises" that knit their activities together. *Thirdly*, it is a close social network characterized by nearness, simply because the actors all perform their task in the same local community. *Fourthly*, it is also a domain-specific network. The professional knowledge, on which the network relationships are grounded, is limited in scope, but related to highly specialized functions and occupations.

The collaboration is institutionalized through two streams of activities. The *first* one referring to a pattern of collaboration that comes from the labor division reflected in the distributed curriculum of vocational training itself. Workplace instructors, teachers and school managers collaborate about the incubation of school students towards the standard required for acceptance in an apprenticeship position at the workplace. The *second* stream of network activities is joint courses and competence development projects that mobilize the network actors. Thus, mutual adjustments are enabled, but even more important, a common ground for developing shared understanding of their respective roles in the distributed curriculum is made possible.

All three 'layers' provide opportunities for face-to-face interaction, which is a prerequisite for the construction of a shared practice (J. S. Brown & Duguid, 2001a, 2001b). The activities and processes occurring in each of the layers are distinct and their conjoint contribution makes impacts on the local and lateral adaptation process. The distributed community of practice thereby activates the institutionalization of a shared practice repertoire in to more coherent routines at the subunit level of the loosely coupled secondary school¹¹¹.

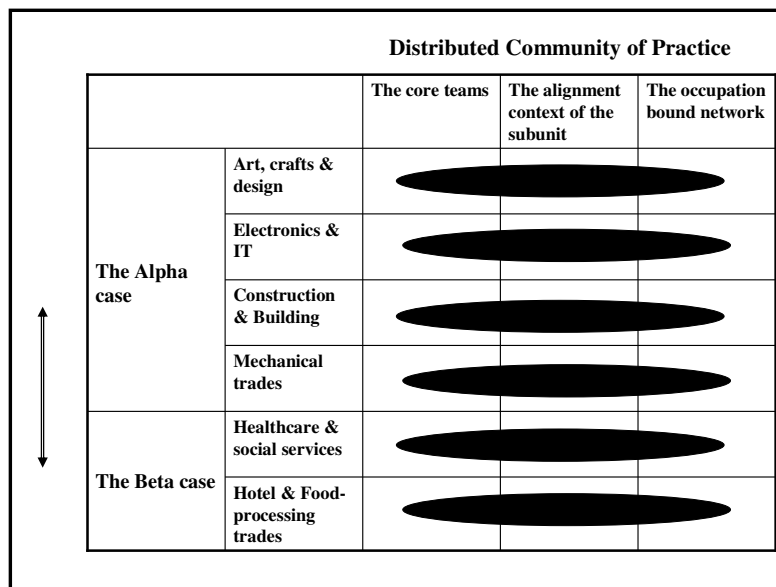
10.3.3 Level of analysis

Another analytical point of importance refers to level of analysis. Each subunit within the school organization may in principle host, cultivate and

¹¹¹ See the model in figure 4.1. In the framework presented by Crossan and associates (Crossan et al., 1999; Vera & Crossan, 2003) institutionalizing represents the final stage of the adaptive learning cycle, where routine elements and practices are habited at a collective level of the organization

maintain its distinct distributed community of practice. The analytical point is illustrated by the model in figure 10.2.

Figure 10.2: Locus of distributed communities of practice



The distributed community of practice evolved at the subunit level, simply because the problems and dissonance are displayed at this level of the school. Through this genuine lateral social structure, external stakeholders become positioned, so that they may negotiate with school professionals about important demands, seen from the working life sphere. Due to this attribute, external demands imposed from the workplaces would have a higher probability of resulting change close to action in the classrooms. Conversely, the distributed community exposes significant reservoirs of additional resources for school professionals. The activities and processes that occur in each of the layers are distinct and it is their conjoint contribution that impacts on adaptation efforts. Neither the specific teacher teams nor the social network provides the full picture for capturing the analytical importance of the distributed learning structure as grounded on the empirical evidence. The distributed community of practice concept, however, allows for using the aggregate of the three layers as a meaningful social category.

10.4 Local adaptation situated in a distributed community

The descriptive data portrays a *local adaptive learning* cycle situated in the distributed community of practice. Likewise, the local adaptation cycle is problem based and learning driven. *Firstly*, the process is problem based, since a series of technical demands are imposed on the local school actors from the outside. When demands require adjustments to be made, problems are to be put on the agenda. *Secondly*, adaptive learning is promoted by knowledge brokering devices undertaken by middle managers. *Thirdly*, the learning process itself is about integrating insights, performance feedback or new tools in to a collective repertoire. Since the context is distributed in nature, learning is complex and refers to multiple forms of knowledge integration.

Three interrelated, yet distinct, learning processes arise from the analysis of the two sub-cases. Knowledge integration in the first layer, within teams, refers to the integration of individual insights and proposals into a team repertoire. In the second layer, integrative learning refers to between-group learning, which is a fundamentally different process. Not only is the number of individuals higher, but they are also bound to different team practices, which makes this enterprise far more complex. Alignment is bound to the context of the subunit, where a small number of teacher teams share regular meeting places headed by the middle manager. The third form of integrating learning, mutual adjustment refers to network learning, where players of a local occupation-bound network adjust their understandings mutually through negotiations. The analytical inference shows that it is the totality of these three learning operations, as such, that supports the institutionalization of practices into a local routine (Zucker, 1991).

10.4.1 The notion of organizational dissonance

The case study shows that adaptive learning is problem based, which has been at the heart of theories of adaptive learning all from the early start (Cyert & March, 1963; March & Olsen, 1975). The core argument states that when organizational actors perceive difficult demands from their environments, for example through performance feedback, they activate a search¹¹² for better solutions in the same area. For example, if teachers in the

¹¹² Cyert & March (1963) used the term ‘problemistic search’ about the problem-based nature of adaptive learning. And search for solutions starts in the same area of the external environment as problems have arisen. As strikingly noted: “If prices fall in Texas, search for solutions also takes place in Texas” (March, 1994a, p. 28)

training program of healthcare and social services perceive negative performance feedback from the workplaces, they normally search for improvements in the same domains. The theoretical argument states that the locus of both problems and solutions is often found within the same territory of the environments. The data analysis presented in chapter six demonstrates that the vocational training field is characterized by several constraints and recurrent quality problems. The case study brings evidence that this stream of external constraints activates search and adaptive actions, and this inference is conceptualized by the notion of organizational dissonance (Kvålshaugen & Amdam, 2000). The main categories are specified in table 10.3.

Table 10.3: Dimensions of organizational dissonance

CATEGORIES OF ORGANIZATIONAL DISSONANCE	DESCRIPTIONS
Internal complexity	<ul style="list-style-type: none"> • Heterogeneous student groups • High frequency of students with low cognitive, behavioral and motivational status of the students • Complex social interactions, e.g. more consultancies with aid services
External dependency	<ul style="list-style-type: none"> • Asymmetric distribution of power, resources and information • School role reduced to the one of 'sub-contractor' • Assessment and certification takes place outside the school's domain
Cognitive distance	<ul style="list-style-type: none"> • Incompatible frames of references regarding didactical categories of schooling • Divergent organizational logics • Divergent quality criteria

The descriptive data thus shows that dissonance is rooted in internal complexity and external dependency, paired with potential cognitive distance inherent in the structure of the training program. Dissonance refers to recurrent problems that occur and re-occur in the technical core of the school. From this perspective, organizational dissonance describes a motive structure for undertaking adaptive actions: Search for new solutions, selection, imitation and adoption of new elements to the existing stock of

routines. Grounded on the evidence, I also argue that the pattern, through which organizational dissonance occurs, is of an iterative and cyclical nature, simply because it is associated with new student cohorts, new problem cases, new curriculum demands and shifting actors on both sides of the school boundary. Bearing in mind that dissonance is rooted in the internal technology as well as in external constraints, adaptive efforts must combine an inward looking and an outward-looking perspective. Accordingly, organizational dissonance shapes the rationale for the construction and maintenance of the distributed community of practice, because this genuine learning structure brings teacher practice closer to the practical issues of the workplaces.

10.4.2 Knowledge integration within teams

In line with the review of theoretical sources in chapter three, the descriptive data suggests that knowledge integration entails a cognitive and a behavioral component. To the *first* one, the cognitive aspect refers to transformation of understandings (Bechky, 2003; Carlile & Reberich, 2003), where individually owned insights are presented in a group and processed through dialogue, discussions and negotiation about meaning. The descriptive data portrays a transformation process based on diagnosis of student learning, feedback from the workplace, direct evaluation and meetings with student representatives. Other recurrent topics on the team-agenda are discussion about what under-specified goals, objectives and pedagogical concepts mean in practical terms, and how, or to what extent, they should be implemented into classroom instruction. Transformation thus involves collective interpretation and negotiation of meaning, in terms of what is the 'right' and 'rational' inference to be drawn from all the information available. The integration results in new knowledge fractions that are converted into the existing stock of understandings, frameworks and tools owned by the group of practitioners.

The *second* phase of knowledge integration refers to incremental adjustments in the team practice, i.e. the micro routine that guides the members' behavior in the classroom and the members' follow-up activities towards the workplaces. This phase refers to action repertoires, which in themselves escalate the potential for learning interruptions and conflicts (Shrivastava, 1983). Learning from colleagues, and taking fresh knowledge into account in practical terms, requires an open micro-political agenda, which is far from self-evident (Lawrence et al., 2005). In consequence, the need for support, guidance, supervision and facilitation from the 'team-

owner', the middle manager, is required in this form of intense within-team learning. Moreover, as consistently described in chapters seven and eight, the middle managers allocate a substantial pool of resources in order to facilitate, support and deal with recurrent team-related situations. An overview of the knowledge integration process, as emerges from the case analysis, is presented in table 10.4.

Table 10.4: Knowledge integration within core teams

CONCEPTUAL CATEGORY	DESCRIPTIONS
Integrating knowledge within teams of teachers	<ul style="list-style-type: none"> • A cognitive transformation process within teams driven by dialogue, collective reflection and purposeful discussion upon individual members' classrooms experiences, ideas or solutions adopted from others (Crossan et al, 1999) • Adjustment of practices through fine-tuning, refinement and replacement of routine elements that is included in the team's repertoire (Shrivastava, 1983) • Intense brokering repertoire as facilitator is required (Balogun, 2003)

The teams are homogenous groups, simply because they are recruited from the same knowledge domain and field of specialization. The cognitive distance between team members is therefore low and stable, which is in favor for knowledge transformation within the group. The team technology enables trial-and-error efforts, and thereby learning from direct experiences to occur (March, 1991). As shown in the descriptive accounts, teams have developed a range of instruments in action for frequently *mapping learning behavior* among the number of students for whom they are responsible.

10.4.3 Alignment of practices - sharing of knowledge between teams

When shifting to the second layer of the distributed community, the size of the group increases by five to six fold. The members are more loosely knit and the level of engagement less intense. The frequency of meeting is also lower. Furthermore, the cognitive distance between team members is higher, simply because the participants, although they belong to the same knowledge domain, have developed their own team practice. There are, in other words, knowledge boundaries to be taken into account in this setting (Carlile, 2004; Scarbrough et al., 2004). We talk about an intermediate level of interaction, tightly coupled to the core teams through overlapping membership, and at the same time connected with the outside world through the participants' social ties. Learning in this context refers to the identification of variability in practice, including 'best practices', along with the assembling of feedback streams from the workplaces. A description is given in table 10.5.

Table 10.5: Alignment of practices

CONCEPTUAL CATEGORY	DESCRIPTIONS
Alignment of between team differences and variability	<ul style="list-style-type: none"> • Identifying between-team differences and exposing them for discussion • Sharing of experiences in subject department meeting and informal subject forums • Identifying problematic areas and lack of resources in the core teams • Collective reflection and joint engagements upon feedback from the workplace • Dialogue on ambitions, practicalities and student involvement

The learning process itself refers to a homogenization enterprise, where a reduction in unintended between-team variability is sought. However, alignment also refers to the adoption and diffusion of 'good practice' across the boundaries of the teams.

10.4.4 Mutual adjustments among network partners

In the third ‘layer’ of the distributed community, the learning process is substantially different. It occurs in more fluid and informal contexts, ranging from informal meeting places and ad hoc projects to cooperative forums. On the other hand, joint projects, e.g. courses, certification of workers and joint competence building, contribute to the construction of a shared body of knowledge. The nature of the learning is conceptualized as mutual adjustments of practice, e.g. revision and refinement of shared understandings accompanied by the adjustments of frameworks and incubation rules. The relationships are horizontally shaped, based on social ties formed between the technical level of schooling and workplace institutions, and the learning process is boundary spanning in nature. Descriptors of mutual adjustments are specified in table 10.6.

Table 10.6: Mutual adjustments in the professional network layer

CONCEPTUAL CATEGORY	DESCRIPTIONS
Mutual adjustments of practices in the occupation-bound network	<ul style="list-style-type: none"> • Diagnosis of divergence between teaching and workplace demands • Diagnosis of competence building demands for teachers and workers
	<ul style="list-style-type: none"> • Modifying educational provisions • Action for altering student codes • Establishing joint projects • Initiatives for joint competence building • Initiatives for better incubating students • Actions for using workplace personnel more active in-school

A recurrent agenda refers to ways of improving the fit between instruction and training through more integrated frameworks and more flexible use of personnel. These adjustments include for example, allocating more human resources from the workplace into school instruction in order to enhance the relevance of teaching, and to reduce the gaps for students when they enter the scene in business firms or public service providers.

In both sub-cases, the professional network actors have developed a range of projects, through which they join their activities. These projects deliver

authentic knowledge outcomes for all parties. For example, joint courses and certification projects construct a network-shared knowledge base that is argued as useful to the participants. Projects and courses are thus important, in order to create a cognitive basis for mutual adjustments. Project activities are furthermore located to meeting places that are regularly in use by the players, for example branch associations, industrial forums, cooperative bodies and other regular meetings. Mutual adjustment therefore emerges as a form of network learning, promoted through social forums and meeting places and joint projects. Furthermore, a 'protective belt' of external players in the local and regional working life: Branch associations, industrial agencies, confederative bodies of business lines and so forth supports network learning.

10.4.5 The shared practice

The term 'practice' in daily language most commonly means close to 'doing the job'. In a more strictly theoretical sense, the term practice connotes not only tasks and work activities. The conceptual meaning of the construct entails rather 'knowing about doing' certain tasks and responsibilities (Cook & Brown, 1999; Duguid, 2005; Orlikowski, 1998, 2002). Moreover, the term also denotes a *shared practice*, in the sense of a collectively owned knowledge asset that, one on hand, guides the individual members' work behavior¹¹³. On the other, in order to utilize the practice, the individual member must be on the inside of community of practice. The empirical data portrays a *practice* that guides, provides support for, and exerts influence on the professional activities involved in-school instruction as well as in workplace training. The practice is described as a coherent although flexible framework, a body of declarative knowledge that exerts significant influence on the totality of the vocational training chain. The main ingredients of the shared practice, as grounded on the case study, are specified in table 10.7.

113 As elaborated by Wenger and associates, observable components of a shared practice may lie in written rules, handbooks, websites and knowledge databases that members share, but the practice also embodies "a thinking style, and even in many cases, an ethical stance. In this sense, a practice is a sort of mini-culture that binds the community together" (Wenger et al., 2002, p.39)

Table 10.7: Description of the shared practice

CATEGORY	EMPIRICAL DESCRIPTORS
Share understandings and sense of purpose	<ul style="list-style-type: none"> • Shared understandings of how to train candidates most effectively: Didactical conditions, resources needed, cognitive and behavioral requirements
Incubation framework	<ul style="list-style-type: none"> • Preparation routine for students towards workplace socialization • Incubation framework for students when they enter workplaces • Rotation routine that grips earlier into the school part of the program
Interval technology	<ul style="list-style-type: none"> • Decoupling of local governed instruction periods from the central timetable routine • Teams are empowered to replace timetable activities with their own didactical repertoire
Differentiation framework	<ul style="list-style-type: none"> • Follow up of alarm zone students by team members • Individualizing of curricula and plans for students with special needs • Level-differentiation of instructional materials, methods and assessment
Community development	<ul style="list-style-type: none"> • Creating new meeting places • Strengthening linkages to formal bodies and associations and the civil service • Pursuing new joint projects and externally funded learning resources

This lateral and local routine is distributed in nature, because it is grounded on discrete activities, and in a systemic sense, the elements are loosely coupled parts. Integrative mechanisms that bind together activities are overlapping membership and participation. Schoolteachers ‘move’ knowledge from one location to another simply by their engagement. Similarly, when specialist workers are engaged in work in the school territory, a parallel mechanism is activated. Moreover, the shared practice is strictly delimited to a narrow workplace domain.

The analytic frames drawn from the case evidence therefore conceptualize a body of rules, frameworks and models that supports adaptation in three

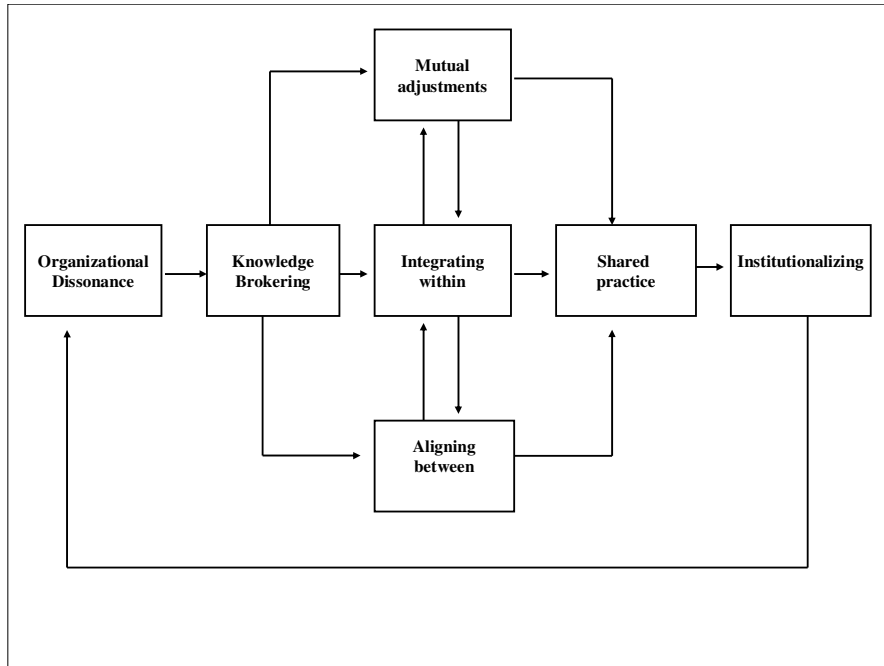
different ways. *Firstly*, the practice elements situated in the professional network may improve the fit between school instruction and workplace demands. *Secondly*, it also supports the building of shared understandings of problems related to training and socializing young people in a complex and challenging educational field. *Thirdly*, the practice repertoires also promote shared understandings about the challenges competitive and knowledge intensive workplaces have to deal with. This component is important, in order to increase relevance of school instruction. As underscored in the descriptive data, the network collaboration has increased the level of mutual trust and understanding.

10.4.6 Institutionalizing learning at the micro level

The three distinct learning operations are, consequently, socially located at the three levels of the distributed community of practice. An important analytical point is that it is their joint outcome, i.e. the shared practice negotiated throughout the whole learning system that promotes adaptation. Through integrating knowledge within closely-knit teams, complex and diverse didactical conditions are sought to be resolved. The second type of integrative learning, i.e. alignment, refers to the reduction of variability in practices between teams. However, learning also takes place in joint engagements that unite teachers and workplace specialists, aiming at reducing gaps between school conditions and workplace demands. The mutual adjustments are embedded in dense, close and strong professional ties, and the relationships in focus are shaped by a series of joint projects and enterprises that mobilize attention of energy from the participants. Within the domain of a subunit, the shared practice emerges as a relatively institutionalized pattern¹¹⁴ (Berg, 1991). The learning mechanism, as grounded in the data, is illustrated by the model in figure 10.3.

¹¹⁴ Berg (1991) uses the metaphor 'deep-frozen ideologies' to capture the habitation (Zucker, 1991) aspect of institutionalization.

Figure 10.3: The adaptive learning cycle



In theoretical terms, the concept of the shared practice, as specified in the descriptive narratives of the case the study, is conceptually close to a local routine restricted to a distinct subunit domain. As elaborated in chapter four, in more recent theorizing about organizational routines, two particular aspects have been underscored. *Firstly*, routines are shaped and re-shaped at the local level of the organization. For example a routine that may seem stable and rigid at the macro level is performed dynamically and flexibly at the lower levels of the hierarchy (Feldman & Pentland, 2003). *Secondly*, routines govern individual behavior, at the same time as routines are affected by individual agency (Feldman, 2000). Routines are conceived more like ‘grammars of action’ (Kieser et al., 2001) that allow individuality, flexibility and local variation. The reason I have applied the term ‘practice’ instead of ‘routine’ is that the shared practice is partly decoupled from the structure and centralized routines of the school organization. Although the terms are close in a generic sense, I prefer the practice concept, at least within this research setting.

10.5 The balancing act of adaptive learning

Local adaptation is analyzed as a balancing act of technical rationality (Thompson, 1967) and commitment and loyalty to institutional demands from the larger unified school of Norway. The outcome of the learning cycle is a dynamic body of knowledge that, largely, guides the behavior of all actors involved in training. This feature makes the practice, as such, a powerful adaptive learning instrument, simply because the practice is negotiated and re-negotiated in a community that holds significant control over the entire training chain. Schoolteachers and their middle manager have a certain professional control over the instruction part, not at least due to the empowered team layer. In addition, the working life partners are in charge of workplace training, and exert some political influence on recruitment of apprenticeship candidates. The practice, therefore, defines a negotiated repertoire of frameworks, tools and rules that guides the behavior both in the classroom and in the actual workplaces. Through this situated curriculum (Gherardi et al., 1998), it is possible for the local school actors to exert social influence on their external workplace environments, at the same time as stakeholders come closer to the conditions of schooling. Learning in this distributed community of practice helps the school actors to find an acceptable balance of demands that in their origins are challenging to match.

10.6 Summary of analysis

The analysis presents evidence that vocational training schools operate in multiple external domains. Moreover, their external environments are fragmented and diverse, and as a result, the externally imposed demands are, multiple, diverse and in some situations conflicting. Determined by extreme forms of loose couplings in the core logic of schooling, school professionals of each subunit couple their activities to distinct and demarked domains in the environments. Adaptation of school practices to external demands is, therefore, both a local and a lateral enterprise¹¹⁵. Adaptive behavior is, as such, an offshoot from the knowledge domain, and the process is activated and re-activated from the subunit level, which is the middle manager's operational territory.

¹¹⁵ This point is illustratively elaborated in a more recently published article by Goldspink (2007) where school professionals establish a lateral learning community together with their external stakeholders, in order to compensate for loose internal couplings.

An additional property of theoretical interest comes from the nature of the demands imposed from stakeholders in the local environments. Although the empirical evidence portrays in detail, strong influence from broad institutional norms, most external demands are of a technical nature. This means that the demands from the external stakeholders exert direct influence on classroom conditions, and these demands are assessable and possible to guide by sanctions from the stakeholders. At the same time, the intake system of upper secondary education in Norway has resulted in increased complexity in the core technology, due to increased frequency of students with special needs and low cognitive capacity.

Adaptive capacity then boils down to finding an appropriate balance between, on one hand, serving the inclusive school regime, and, on the other, satisfying stakeholders in local businesses and public service institutions. This balancing act is at the core of adaptation. Adaptive learning is primarily driven by dissonance, which is of a technical nature. The central finding of the analysis is the distributed community of practice, as specified by empirical categories. Externally oriented, the network is characterized by strong ties and close, high-density interaction in terms of a wide range of enterprises and projects. Internally oriented, the restructure of the subunits into a team-based layer, alongside intensive knowledge brokering, has enabled a distributed community of practice to evolve in both sites. This genuine and domain specific learning structure enables a series of regular interactions to take place, which shape the adaptation cycle. Three forms of integrative learning are situated in the community of practitioners, and these learning operations work in concert. However, they are bound by brokering devices, which highlights the role of the knowledge broker as a decisive agent.

Chapter 11: Summary and concluding remarks

The research problem of this thesis was to investigate how school organizations adapt to external demands. The major research question therefore asked: *How is local adaptive learning managed within the given educational context?* In order to answer this question I have posed the following three sub-questions:

1. What is the nature of the external demands imposed on school organizations?
2. What kind of learning and adaptation processes occur in order to deal with externally imposed demands?
3. What role do middle managers have in school organizations' adaptation and learning processes?

The answer to these questions emerging from the preceding empirical analysis can be briefly stated as follows: The cases studied here faced multiple and sometimes conflicting external demands posed by several external agents. The study has identified important adaptive learning processes within the realms of the organizations. One key finding is that the adaptive learning processes occur at the sub-unit level of the organization. The explanation for this finding is identified in the loosely coupled internal organizational set-up of the schools. Therefore, middle managers play a crucial role as mediators between the schools' technical cores and external stakeholders. They also function as brokers between loosely coupled internal sub-units.

The study has also identified a broader social environment conducive to the school organizations' adaptive learning. This environment, defined as a distributed community of practice, has key implications for the learning and adaptation process. Here, middle managers and external stakeholders form common conceptions and norms, and devise strategies for coping with the schools' challenges. The remainder of this chapter will further elaborate on this conclusion, through pulling together and summing up the findings of this study, as well as discussing the key components in the light of the theoretical framework. The chapter starts with a summary of the findings presented in the empirical section of the thesis. In the second part, four themes grounded on the findings will be presented for discussion. Thereafter, implications of the study for further research will be suggested, followed by practical implications for school management and policymaking.

11.1 Summary of findings

As previously stated, the main purpose of the thesis is to illuminate how adaptive learning is managed in an educational context characterized by strong dependency on external environments. In the field of investigation, vocational training, adaptation becomes a key function for educational success or even long term survival. In order to understand this process, it is necessary to specify how the different subunits interact with external stakeholders. One of the most important missions of the vocational training school is to achieve a successful incubation of students to apprenticeship after they have completed their second year in school. As such, schools and their professionals depend heavily on corresponding workplace stakeholders, in order to succeed in their educational mission. The training programs are structured by a formal arrangement that I have labeled the *distributed curriculum*.

This concept captures, *firstly*, strong dependency on external stakeholders, embedded in an asymmetric distribution of resources, powers and critical knowledge. *Secondly*, the distributed curriculum in itself exposes an extreme case of loose coupling, simply because the components of the program are disconnected and take place in social distance. The essential point is, therefore, that adaptation is a crucial function in this system. Adaptation becomes a key function of effective school management, simply because a close fit between schooling and external demands is crucial for the students' achievements. A key finding is therefore that the school organizations studied are characterized by loose internal couplings and close interactions with stakeholders. This has implications for the response mechanisms of the organization.

As documented in chapter ten, schoolteachers and their middle manager institutionalize a multifaceted and local routine grounded on learning in collaboration with working life stakeholders. The process is problem based and driven by various forms of dissonance. Theoretically, this form of local adaptation is understood as learning in a distributed community of practice (Wenger et al., 2002). The findings of the study confirm that middle managers are uniquely positioned agents to promote local adaptation. The middle management contribution to adaptive learning is multifaceted, and identified categories are conceptually ordered under the umbrella concept of the knowledge broker (Wenger, 1998). Adaptation is then composed of three forms of integrative learning, and these operations are promoted by knowledge brokering devices performed by middle managers.

11.1.1 A loosely coupled system

A striking feature of the school organizations studied is the combination of, on the one hand, a close integration with external stakeholders, achieved through a distributed community of practice, and, on the other, a loosely coupled *internal* organizational system. The key operating unit is that of a relatively autonomous subject department demarked by distinct occupational knowledge boundaries. The subunit furthermore, is only randomly connected to the neighbor units, and the couplings to the central office are infrequent and temporal. This is partially explained by the form of training conducted in vocational schools. A distributed curriculum, involves per se an extreme form of loose couplings in education, simply because the key components of the program are disconnected physically from the organizations as actions take place in dispersed locations. In addition, the guarantee instrument of the legislation is decoupled from the decision making process, i.e. the choice of intake of apprentices.

The cases, therefore, exhibit loose and tight couplings side by side. The inducement of the team layer in the operating core of the investigated cases exposes this point in a striking manner. The team repertoire represents temporal decoupling from the school structure in half of the time span of the school year. On the other side of the coin, the work of the teacher, through the same routine, is strongly connected to a professional grouping through control and compulsory participation. This tangled web of couplings also underscores the dialectical nature of loose couplings in educational organizations, in line with the argument posed by Orton and Weick (1990) and Rowan (2002b). As argued by loose coupling theorists, loose couplings are not necessarily dysfunctional, rather in many cases, loosening structural couplings exposes rational behavior. The analytical point of the loose coupling perspective is that it is difficult to coordinate the technical core of schools from the top apex, and middle managers are therefore uniquely positioned to compensate for this pattern, in line with central propositions of contemporary approaches to middle management in professional bureaucracies (Currie & Procter, 2001; Currie & Procter, 2005; Mintzberg, 1993).

11.1.2 Fragmented environments and demands

One key finding in the data analysis is that vocational training institutions operate in fragmented external environments. As demonstrated in chapter ten, fragmentation means that school professionals depend on, and have to relate to, several different domains in their environments: Local working life, state directorate, regional governance and stakeholders of the teacher profession. A stream of different demands, often incompatible, is imposed on schooling from the surrounding environments, and many of these demands exert direct technical influence on school conditions. Due to the distributed curriculum of vocational training, each subunit operates as an open subsystem directed towards an identifiable domain in the environments, on which they heavily depend. The findings correspond with the original proposition of James G. Thompson, stating that organizational subsystems may relate to different parts of the external environments (Thompson, 2004, p. 26).

Moreover, the study suggests that demands imposed from this part of the external environments are mostly of a technical nature. As seen in chapters two and ten, the term *technical* implies that the externally imposed demands can relatively easily be defined, specified and understood among the involved parties (J. W. Meyer & Scott, 1992). In education, this means expected outcomes, i.e. behavioral and cognitive standards of the students. Technical instruments are typical assessment procedures and control instruments (Rowan & Miskel, 1999). Moreover, technical influence may also be exerted through work process categories: Preferred pedagogical styles, preferred aspects of the curriculum to teach. Work process demands become technical when they are specified. A third source of the influence of technical instruments on classroom conditions are resource allocation and not least, detailed rules of the way students are grouped in the classroom (Busher, 2006).

In this particular study, the findings indicate that workplaces focus on outcome categories and socialization aspects of the work process. Their demands are easily assessable from the workplace side, through observation and monitoring the behavior of the candidates during the praxis rotation periods of the in-school part of the training programs. In addition and most importantly, workplace stakeholders are in a position to guide their demands through sanctions. They can withdraw from collaboration with schools or reduce the number of apprenticeship positions. The selection of apprenticeship applicants therefore works as powerful sanctions from the technical environments of the school.

But findings from macro analysis in chapter six also demonstrate that technical demands are imposed from the intake regulations of upper secondary education - through the guarantee instruments that ensure all applicants access. The technical sides refer to grouping of student in the classes, and direct technical effects on classroom conditions are observable when for example the frequency of students with special needs is high. Furthermore, the observations made through the case study present evidence that significant technical effects are manifest in heterogeneous classes and more students with special needs. Macro analysis and case evidence in concert thus show a diverse and complex technology of teaching. Technical effects from the intake regulations are suggested to be a stable feature of the Norwegian vocational training field and distinctively different from academic schooling.

In addition, the case studies show that school professionals are influenced by demands from the larger institutional environments (Scott, 1995; Scott & Meyer, 1991). The findings demonstrate strong commitment and social obligations to broader norms of inclusive schooling. Inclusive schooling is a strongly defended normative component of the unified school institution of Norway. The case study brings evidence that this institutional norm is embodied by local school policy, decision-making, priorities and micro practices. These preferences are made, although they amplify the complexity of their technical core, and make work conditions even more challenging. The finding is therefore theoretically understood as normative influence from the institutional environments surrounding the vocational training school. An additional aspect of the fragmented school environments is lack of correspondence between input and output demands (Thompson, 2004, p. 27). For example, the governance system of the county, which provides financial resources, is typically focused on the input side of schooling – the obligation to provide applicants one of their preferred wishes. Workplaces, in contrast, will inspect and assess the output categories of the students - standards of skills, behavior and work attitudes. Expectations from this diverse collection of stakeholders not surprisingly, may be of an inconsistent and incompatible nature.

This complex blend of external demands is theoretically understood as a recurrent source of dissonance. The term organizational dissonance (Kvålshaugen & Amdam, 2000) describes recurrent demands that are challenging for school actors to deal with. Chapter six brings evidence that dissonance is a stable within-field characteristic of vocational training, for example manifest in study progression problems and high dropout rates. Besides, the term describes a local mismatch between imposed demands and available solutions provided by structure and routines. Appropriate solutions are not provided either from the central office of the school, or from the civil

service bureaucracy. Dissonance at the local level is thus seen as a function of contingencies, constraints and demands of the school's environments.

The most effective response strategy is then local adaptation, through direct negotiation with stakeholders, mutual learning, and rapid adjustments of didactical conditions. The findings of the study portray organizational dissonance and local adaptive learning as intertwined phenomena, simply because the first one activates the other. Dissonance is furthermore cyclical and iterative in nature, simply because new intakes take place every year. Adaptive learning is, therefore, iterative and cyclical in nature, in line the theoretical framework presented in chapter four. Local adaptation entails, as shown by the cases, a balancing act of appropriately matching schooling to working life demands, at the same time as the schools maintain an inclusive school policy rooted in regulatory obligations as well as professional norms.

11.1.3 Adaptation through a distributed community of practice

The central finding of the study shows a pattern of adaptive learning shaped through a distributed community of practice. Community of practice has previously been defined by Wenger and associates and by Brown and Duguid. The main ingredients of this learning structure are a flexible team layer connected with the external workplaces. The distributed community, populated by schoolteachers, their middle manager and corresponding workplace actors, host a web of relationships bound to the same knowledge domain. Besides, the findings of the study specify a stock of shared understandings, practical tools and methodological frameworks that influence both teaching and workplace training. This shared knowledge base is theoretically understood as a practice, a situated grammar of action (Gherardi et al., 1998), that guides the behavior of schoolteachers, job training instructors and their respective managers. In line with the theoretical framework discussed in chapter four, it is this unique combination of community, knowledge domain and practice that opens up for the community's function as a local adaptive system

In addition, it is the distributed nature of the community of practice that enables this social organization to work as a local adaptive system. Through the boundary spanning structure, school agents may monitor and track changes in their technical environments more or less in real time. Strong and dense network ties enable sensitivity to "environmental influences that require them to be informal, flexible and light-on-their-feet" (Scott, 2004, p. 10). Additionally, through the layer of empowered teams on the school side,

schoolteachers and middle managers are enabled to make rapid adjustments in teaching routines when needed. The thesis therefore argues that the distributed community of practice construct may be a useful analytical tool for improving the understanding of how loosely coupled schools may adapt to their environments.

The evidence also specifies a local adaptive learning cycle situated in the distributed community. Four process elements are assembled into an adaptation cycle. The first component is organizational dissonance, which activates and stimulates a web of learning activities. The second component is knowledge integration, which is at the heart of adaptive learning (Crossan et al., 1999). Three distinct forms of integrative learning are situated in the distributed community: Integrating of knowledge *within* teams, alignment of practices *between* teams and mutual adjustments *among network* partners. These learning operations work in concert, but they reflect different levels of interaction. The third component refers to the outcome of the learning cycle, theoretically understood as a shared *practice*. Its constituents are shared understandings, sense of purpose, practical tools, negotiated solutions and frameworks that inform future problem solving. The shared practice constitutes a communal memory and a dynamic local routine that is shaped and re-shaped through the interactions. Since this practice is shared among all involved parties of a specific training program, it emerges as a powerful adaptive instrument. Seen from the subunit level of the school, this local routine institutionalizes a relatively stable pattern of how to work with training effectively. The local routine is partly decoupled from the school structure, at the same time at it couples the work of the teachers tighter to the job training and apprenticeship context.

Since the three forms of integrative learning take place in different contexts, the adaptation cycle is distributed in nature. Knowledge brokering is, therefore, a key function, in overcoming potential learning barriers inherent in this loosely interconnected structure. The data analysis shows that knowledge brokering by middle managers influences the three learning operations positively and this agency contribution is contingent on an action repertoire undertaken by middle managers, understood as dimensions of a knowledge broker role. The evidence therefore supports the widely held notion that middle level leadership is a key factor in bringing about school improvements, although the conceptualization suggests some novel elements.

11.1.4 Brokering from the middle

The findings expose that the middle managers utilize a range of boundary spanning opportunities in order to sustain adaptability within their subunit territories (Floyd & Wooldridge, 1997). As such, the finding is in line with baseline assumptions drawn from the theoretical framework of middle management reviewed in chapter three. It has been suggested that boundary spanning is a predominant part of middle leadership in schools and other professional bureaucracies, but the study also brings evidence that the middle manager's contribution to the adaptive learning process is not entirely covered by the boundary spanner concept. For example, the case evidence shows that middle managers engage heavily in a range of within team situations, both as facilitators, supervisors and transactional leaders. These practices have little to do with boundary spanning.

These activities, in sum, constitute what Wenger (1998) previously has referred to as knowledge brokering. The thesis has identified four underlying dimensions that apply to middle managers' knowledge brokering, liaison, translator, facilitator and transformer. In particular, the two latter dimensions underscore that the knowledge broker's repertoire is intense and close to action. The middle manager as translator captures a repertoire activated in order to make perspectives understandable and acceptable across boundaries. The translator concept mirrors the image of a learning dyad between two parties, and the translator uses his or her capacity to bridge information and knowledge from a source to a recipient. For example, the translator dimension describes the middle manager in communicating and editing feedback and perspective from the workplace to a teacher team. In addition, vertical translations between teacher teams and the management team, and vice versa, are important functions. Similarly, the middle manager activates a translator repertoire by mediating perspectives and constructing compromises. The findings also demonstrate translator activities undertaken by middle managers in pursuit of learning between teams through recoding information and exhibiting good practice.

The notion of the liaison focuses on the ways in which actors take active part in the social systems and structures that surround them. The dimension also encompasses a representative role on behalf of their subject domain as well as the proactive use of social connections to gain supplemental resources. The data analysis extensively portrays the middle manager's engagements in ambassador activities and social networks. The social network is domain specific, i.e. demarked by occupational boundaries, and characterized by strong and dense ties and spatial closeness. The network hosts a web of initiatives and engagements in courses, projects, local business enterprises

and utilization of occupational and industrial forums to create opportunities for shared interests. The term liaison is used, because it also connotes an unbiased actor with a considerable level of legitimacy on both sides of the school boundary (Schultze & Orlikowski, 2004).

The facilitator dimension assembles a range of activities aiming to create enabling conditions for learning for teacher colleagues (Balogun, 2003; Balogun & Johnson, 2004). For example, the findings demonstrate that middle managers supervise the teacher teamwork closely in time and distance. Facilitating work is particularly motivated by problems related to student cases. The empirical evidence highlights a range of supportive engagements *within* teams, where teacher colleagues need help and advice to make sense out of complex and difficult situations. The facilitator dimension also captures a range of quality initiatives undertaken by the middle manager, by formation of projects and creating favorable conditions for experimentation and variation.

The transformer dimension is intense, since it is associated with conflicting situations. The empirical descriptions that ground this analytical narrative, report both interference and active engagement prompted by the middle manager. The purpose is most typically to induce some adjustment or re-orientation in the team's work. Social origins might be negative feedback from workplaces or his or her judgment of unsatisfactory student learning. The middle manager as transformer takes active part in the dialogues, discussions and proposes initiatives. The data analysis shows that the four dimensions are overlapping in nature. They are also combinable, which means that the middle manager employs more than one role dimension in one specific situation. They are all sensitizing conceptual terms that provide lenses to various aspects of the middle management with adaptive learning without providing precise definitions.

11.1.5 Integrating the elements

The main part of the investigation takes place in two sub-cases selected because they have demonstrated a fairly well developed capacity of balancing technical adaptability with normative obligations. The selection thus allowed the researcher to investigate the complex pattern involved in this form of collaborative learning and adaptation. The case study was thus, favorably positioned to investigate the nature of the structures, processes and management roles driving the adaptation pattern. Both sites have developed a distinct and context bound community of practice as adaptive context. This means that adaptive learning takes place in a practice context that supports

interactions between schoolteachers, school managers and workplace actors. The interplay between learning context, learning operation, learning outcome and the knowledge broker role is matched in table 11.1.

Table 11.1: Integrating the elements from the data analysis

		COMMUNITY OF PRACTICE LAYER		
		<i>Third layer</i>	<i>Second layer</i>	<i>First layer</i>
ADAPTIVE LEARNING CYCLE	<i>Knowledge broker dimension</i>	Liaison	Translator	Transformer Facilitator
	<i>Learning process</i>	Mutual adjustment	Alignment	Knowledge Integration
	<i>Practice component</i>	Shared understandings Frameworks Community building	Educational sub routine	Differentiation technology

The shared practice, which is negotiated and re-negotiated throughout the learning cycle, is the first-order adaptive vehicle. The team repertoire enables schoolteachers to deal more effectively with internal complexity in the classroom work. Moreover, shared understandings and frameworks emerging from network engagements enable them to tighten the couplings to the workplaces, in addition to joint benefits. The alignment process integrates the elements into a local routine through long term institutionalizing. Adaptive learning is thus shaped through purposeful management, in order to find an appropriate balance between, on one hand, serving the inclusive school regime and, on the other, satisfying stakeholder demands imposed from local businesses and public service institutions.

11.2 Discussion

In this section, I intend to raise issues for a more theoretical based discussion. They are, on one hand, well represented in the findings of the

study, at the same time as they, on the other, reflect central themes in the literature reviewed in the theory section:

- *Specification of the school's external environments*
- *Rethinking loosely coupled schools as adaptive systems*
- *The full complexity of academic middle management*

In addition to these three issues of a stricter theoretical nature, the major difference between academic schooling and vocational training is taken up. This latter substantive topic emerges consistently during the data analysis, especially from the initial part of the case study, where the site sample also included three academic sites. This issue is also an important part of the sector-specific data analysis presented in *chapter six*.

11.2.1 Specifying the school's environments

As laid out in chapter two, the dominant conception of schools as adaptive systems is built on two widely recognized propositions. *Firstly*, the new institutional theory states that school environments, although fragmented, are dominated by actors that reward and lend legitimacy to those who follow institutional demands, i.e. social categories praised by the dominant coalition. *Secondly*, external stakeholders may exert strong influence on how schools and their managers express their visions about future schooling through official talk and written school policies. However, when it comes to classroom work, new institutional theory claims that the technical core is normally decoupled from external influence. Moreover, school managers tend to buffer and protect teachers from internal administrative control, rather than interfere in the classroom.

The findings show that external demands are imposed from different domains of the external environments, and that they may be different or even incompatible. Local working life, regional government, civic community and teacher associations, to mention a few, constitute distinct domains of the school's environments. The external world is therefore fragmented, and school actors may therefore perform a balancing act. The major inference from the study shows that vocational schools are confronted with strong technical demands from working life environments, and these demands must be dealt with seriously and proactively, in order to promote effective training. They constitute an external context close to the concept of task

environments¹¹⁶. The findings of the study demonstrate that vocational training schools, which count for almost half of the entire upper secondary sector in Norway, therefore, operate in strong technical environments.

Technical demands from the workplaces are, furthermore, almost impossible to buffer or bypass through decoupling. Such a managerial strategy would eventually lead to educational failure of large proportions. The decoupling proposition from new institutional theories, therefore, has limited validity within this educational territory. In addition, the study has brought evidence of loyalty and commitment to broad normative rules of inclusive schooling, which are key components of the Norwegian unified school institution. In consequence, school managers of this field have to balance pure technical demands to their school activities with institutional obligations. The thesis therefore, argues for, firstly, a renewed discussion of institutional and technical domains in the school's environments, in order to advance theory building of school organization. Secondly, the thesis argues for the need to specify the conditions under which external demands may exert technical influence on classroom work.

11.2.2 Rethinking loosely coupled schools as adaptive systems

Since school managers of the vocational domain must face constraints and contingencies of the working life environments, each of the subunits must therefore be adapted to these local domains. The findings of the study thus support loosely coupled system theory in its recommendation of local adaptation as the most effective response strategy. The mainstream Norwegian upper secondary school represents a range of loose couplings, due to the high level of internal fragmentation in knowledge domains. Within the vocational training part of the system, the distributed curriculum represents in itself a close to extreme case of loose couplings. In this context, lateral adaptation emerges as the best form of 'technical rationality', and local communities of practice are suggested as a potential strategic instrument at hand for school professionals.

Communities of practice in organizations in their origins are created and maintained in order to resolve work-related problems, and can therefore be used fairly well as adaptive systems. Because local adaptation is domain specific, a domain specific social organization that includes outsiders not

¹¹⁶ These occupational fields correspond fairly well with Thompson's (1967) notion of external task environments. From this part of the organization's external environments, influence on the technical core is exerted.

affiliated to the organization, may be a potential instrument. Moreover, the community dimension, the fact that members meet regularly, ensures a minimum level of critical input and some cognitive distance, simply because the members perform their work in different contexts. Additionally, the practice dimension directs attention to a jointly owned stock of knowledge, tools, understanding and frameworks applicable for mutual adjustments. Since local adaptation is a mutual process, a joint learning context is a powerful instrument. As stated by James G. March, organizational actors “adapt to their environments as the same time as their environments are adapting to them” (March, 1994a, p. 236).

The study shows a prototype of an enlarged distributed community of practice. The findings suggest that tight lateral couplings between school actors and stakeholders shape adaptation to the key domains. Such a lateral structure that recruits members and mobilizes their resources enables mutual adjustments. Community of practice theory, therefore, offers a powerful repertoire for capturing how loosely coupled schools can work as adaptive learning systems from the local level. The study argues for further discussion of the scope and applicability of communities of practice theory as adaptive vehicles in a school context. This form of local adaptation may offer a complementary contribution to school improvement theory, although it represents an unrecognized area in the school leadership literature.

11.2.3 The complex sides of academic middle management

The thesis confirms evidence about the importance of boundary spanning as a foundation of middle level leadership influence in schools. This line of argument is strongly in line with middle management studies drawn from broader samples and other categories of professional bureaucracies. The educational literature has paid most attention to the problematic sides of the boundary spanning side of middle management in schools. Dominant themes of this discourse are role ambiguity, role conflicts and tensions experienced by middle managers. Although a series of role-stress categories has been reported in the educational management literature, there is little or no evidence about how role stress co-varies with job-satisfaction and work performance among middle managers. The thesis recognizes that role stress can be understood as a stable feature of the boundary spanner’s job, simply because boundary spanners do their work in different locations with conflicting expectations to the role incumbent. The empirical evidence brought up by the thesis indicates co-existence of both role stress and social influence. Simply, whereas role stress can be approached as the downside of being a boundary spanner, the same opportunities provide a range of avenues

for professional influence. The question is then, does role stress influence the job of the middle manager negatively. The thesis recommends that this issue be discussed further in large samples that allow for capturing the possible relationships between levels of boundary spanning, role stress and influence on adaptability in a consistent large-scale design.

11.2.4 Demarcations between academic and vocational domains

A purely substantive discussion, although relevant for managers, policy makers and researchers refers to the context bound demarcations between academic schooling and vocational training. Since the mid 1970s, the dominant paradigm of school organization in Norway has been to assemble all lines of upper secondary education in one organizational system. The principle is seen as rooted in the unified school ideology, which has strongly emphasized equality among teacher groups and domain of schooling. The thesis, therefore, sees Norwegian upper secondary schools as structured by an ideology-driven design parameter. Moreover, the thesis claims, at least assumes, that this dominant norm of how to structure education organizationally has overlaid substantial differences and demarcations. The thesis argues implicitly for explicating these significant differences within the upper secondary sector, in order to meet quality problems more effectively.

The analysis of chapter six shows substantial quality problems within the vocational training field. The analysis particularly points to severe completion problems and study progression problems throughout the entire training field. Specifically, the rejection in the shift between schooling and workplace apprenticeship, labeled the bottleneck problem, is critical. Academic schooling is also complex, but in a different manner. The completion problems are only modest, but the course structure is complex, due to the opportunities Norwegian students have to compose their own course-portfolios. The findings of the study show that that the underlying logics of education are quite different and almost incomparable. Vocational training departments see themselves as micro-constituents in local branches and working life fields in the local environments. In consequence, the school-external life boundaries are blurred, and this marks a clear demarcation between the two fields. Adaptation, school management and school leadership, therefore, emerge as different functions across the two fields, although residing in the same design. This crucial property is blurred in most policy documents, which tend to over-emphasize the dominant rhetoric of being a unified upper secondary school in Norway. When

substantial differences in core logics are covered, it inhibits effective instruments being activated and promoted with the appropriate strength and priorities. A discussion raised by the thesis is to highlight the natural distinctions of each field of education, in order to promote quality.

11.3 Implications

11.3.1 Implications for further research

In line with summary of findings and the previous discussion, I will suggest three possible research agendas for advancement of the findings provided by the thesis.

1) The relationship between middle managers' level of role stress, job satisfaction and intensity in knowledge brokering devices

The case study has advanced further concepts and ideas used to describe the boundary spanning nature of middle management in secondary schools. The four role dimensions of knowledge brokering represent some extensions in this field. In addition to boundary spanning, the facilitator and transformer dimensions highlight middle leadership functions in team-based school departments, which has been under-investigated to date. The relevance of this topic is high, simply because team organizing is on several policy agendas. The dimensions analyzed emerge from a team context, where teams are empowered, and where practices have been institutionalized over some time. For further research, I would recommend developing all four role dimensions in the form of variables that could be investigated in a large sample of middle managers of vocational training. In that manner, the value of the broker concept could be further examined and raised.

2) Longitudinal case study of adaptive learning and practice development in a community of practice context

A longitudinal case study exhibiting the potential for uncovering the formation, growth and possible downsizing of communities of practice may add value to the findings. Important enabling conditions could be detected.

In a similar vein, the relevance of the three indicated learning processes could be tested in a more robust case study design.

3) Social network analysis of relationships between middle managers and working life stakeholders

The point here is to investigate the whole range of relationships, i.e. social ties, not only restricted to the school side. Motive structure and interaction patterns among the full range of nodes would test the many assumptions underlying the findings of the study. Strength of relationships would be interesting to uncover, which requires a more robust design and large data samples.

11.3.2 Implications for policy making and management

Vocational training counts for almost half of the capacity in current Norwegian upper secondary education. When more of a third of all students that start their career in a foundation course drop out of the system, it represents a major dysfunction of the entire upper secondary system. As seen, the major aim of the policy reform of 1994 was to include the groups that systematically fell outside the system, alongside improving the fit with the working life. The reported problems in chapter six raise serious questions about the fulfillment of these ambitious aims. To date, the key ratio of policy success has been share of applicants that are offered one of their top priorities when they apply for the foundation course. The thesis directs more attention to the output side of the system, arguing that a high intake rate has limited value if some groups systematically face abruption or abortion of their education career. Specifically, the inherent challenges of the distributed curriculum of vocational training are largely underestimated. This is solidly documented in chapter six. The study has uncovered, analyzed and discussed effective adaptive mechanisms activated from the micro level of the school. The findings of the thesis underscore the importance of communities of practice as adaptive learning systems based upon a high degree of voluntarily professional engagements. The thesis therefore recommends school administrators and school principals within this segment to recognize the value of such constructions, sponsor them and contribute to their cultivation and growth. Following the recommendation of situated learning theorists, communities of practice may also be integrated with the organization's official strategy. In the cases investigated, the researcher would have recommended inclusion of formation, sustenance and cultivation of such learning communities in the school's strategy.

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