Learning to be at a distance

Structural and educational change in the digitalization of medical education

Fanny Pettersson
To Nils
# Table of Contents

Abstract i
List of included papers ii

1. Introduction 1
   Aim and research questions 4

2. Previous research 5
   Distance and regionalized medical education 5
   Digitalizing higher and medical education 7
   Teachers 9
   Students 11
   Management 13
   The influence of the educational context 15
   Methodological implications in the light of previous research 17

3. The context of medical education 19
   The medical program in Sweden 19
   The medical educational practice 21
   Regionalizing the medical program 23
   Summing up 26

4. Theoretical framework of CHAT 27
   The first generation of activity theory 27
   The second generation of activity theory 28
   The activity system 29
   Dominant and non-dominant activity systems 30
   Conflicts and contradictions 31
   Change and transformation as levels of learning 32
   Summing up – the transition through a lens of CHAT 35

5. Research design and methodological considerations 37
   The emergence of a research design 37
   Methods and data collections 39
   Survey 39
   Field studies 40
   Logs of activity patterns 41
   In-depth interviews 42
   Analyzing and making sense of data 45
   Ethical considerations 46
   Credibility and transferability 47

6. Extended summaries of papers 51
   Paper 1 51
   Paper 2 52
   Paper 3 53
   Paper 4 54
7. Analysis and discussion

RQ 1. Expectations and the influence of previous traditions
RQ 2 Conflicts and changes during a transition
Structural and educational changes during a transition
Notes on contribution to practice
Suggestions for future research
Concluding remarks

Acknowledgements

References

Appendix 1: Survey, teachers
Appendix 2: Survey, students
Appendix 3: Survey, administrators
Appendix 4: Interview guide, teachers
Appendix 5: Interview guide, students
Appendix 6: Interview guide, management
Appendix 7: Information to students
Abstract

As an expression of current challenges faced by contemporary societies, past decades have witnessed heavy demands for higher education to change and transform. One key question here has been the increased digitalization of higher education. Within this wider setting, this thesis deals with an attempt to handle the increasing shortage of physicians in Sweden by way of digitalizing medical education. The aim of this explorative and longitudinal thesis is to describe and analyze structural and educational transformation work in medical education during the digitalization of the program and the transition from face-to-face to distance education. This thesis focuses on teachers, students and management, who are all heavily involved in this transition of the medical program. Two questions guide the research: (1) what are teachers’ and students’ expectations pending the transition, and what are the influences of already established tools and activities on the program and (2) in what ways do conflicts and changes occur over time, and how do teachers, students, and management deal with these as part of the transition? Cultural-historical activity theory (CHAT) serves as the theoretical framework of the thesis. In particular, the concepts of dominant and non-dominant activities, conflicts, transitional actions, and levels of learning inform the analysis. The data are generated by surveys (N = 108), logging of actors’ activity patterns (N = 100 teachers and 100 students), field studies (65 hours), and interviews (N = 62). The data cover teachers’, students’ and management’s roles in the transition. The analysis shows that the way of theoretically understanding the transition – from a dominant face-to-face activity to a new and unproven non-dominant distance activity – have proved to contribute to deeper understanding of the process of digitalizing medical education. The analysis further displays how the transition from face-to-face to distance education creates considerable conflicts that over time force teachers, students and management into structural and educational transformation work. This type of work successively renders new educational design solutions and new flexible ways of organizing distance medical education. This thesis discusses how the structural and educational transformation work forces actors to collectively engage in the transition by experimenting with new suitable methods and designs, as digital technologies and technology-enhanced learning (TEL) could make sense to teachers and students when they are at a distance.
List of included papers

This thesis includes the following four papers.

**Paper 1**

**Paper 2**
First published in *Rural and Remote Health* [http://www.rrh.org.au]

**Paper 3**

**Paper 4**
1. Introduction

This thesis is an explorative and longitudinal study about digitalization of medical education in Sweden. One important reason for this study is that Sweden, similar to many other countries in Europe (OECD, 2012), has for some time faced an increasing shortage of physicians, especially outside of the more populated areas in northern Sweden (The Swedish Government, 1991/92; The Swedish Government, 1992/93; The National Board of Health and Welfare in Sweden, 2010). In 2007 and 2008, two government decisions (The Swedish Ministry of Education and Research, 2007, 2008) proposed an expansion of medical education in Sweden. The resulting increase of admissions called for new ways of educating larger groups of medical students, beyond the traditional campus-based programs, which gradually demanded a regionalization of medical education in northern Sweden. Similar regionalization had previously occurred in other continents and countries worldwide (Maley, Worley & Dent, 2009; Snadden, 2011), but not primarily in Sweden. Internationally, regionalized medical programs (RMPs) often refer to a number of medical students being distributed and incorporated in a number of rural and remote hospitals during their clinical clerkship semesters (Worley et al., 2004; Eley & Baker, 2009; Maley, Worley & Dent, 2009).

This study has its empirical focus on the medical program at Umeå University, located in northern Sweden. For the medical program, regionalization meant that one third of the medical students who started in spring 2011 would be offered to conduct the 2.5-year-long clinical semesters at a distance in three hospitals outside of Umeå. The government decision to regionalize posed a number of challenges to the program board of the medical program. For example, to ensure comparable academic learning environments in all locations, the board needed to establish a process of academisation in regional hospitals that were becoming so-called regional campuses. That involved tasks such as recruiting academic competence, developing scientific research environments and practicing an academic rationale in all locations (Naredi & Johnson, 2009). However, despite the academisation and recruitment of academic staff in all regional hospitals, there were difficulties in delivering some parts of the education in regional campuses (Naredi & Johnson, 2009). To enable teaching and learning between different locations, it was decided that digital technologies and technology-enhanced learning (TEL) would serve as a hub in the program (Naredi & Johnson, 2009; Naredi et al., 2012). This also called for a large-scale digitalization of the program and new ways to arrange for education to be conducted at a distance.
However, according to Moore and Kearsley (2012), taking on the challenges that result from the digitalization of higher education might not always be an easy and straightforward process. Moore and Kearsley put forth that when digitalization continues to advance in speed, then teachers, students and management are challenged by demands of dealing with both structural and educational transformation work in program and courses. Digitalization often calls for structural changes in the tools, rules and division of labour in programs and courses as well as educational changes in the way education is designed, conducted and delivered at a distance (Hauge, 2014; Olofsson & Lindberg, 2012; Olofsson & Lindberg, 2014). Moreover, according to Gregory and Lodge (2015), such structural and educational transformation work often calls for actions that are beyond institutions’ traditional boundaries of knowledge, practice and expertise. For example, for medical education, as a rather stable and reproductive practice primarily characterized by a traditional classroom-based curriculum (Mohamed, 2010), this might require actors to both experiment and learn new ways to organize and design education when they are at a distance (Delgaty, 2015). In other words, teachers, students and management must learn new ways to be at a distance.

Many educational programs and institutions do not yet seem ready for the obligation that comes with the digitalization of higher education. For example, the 2014 European commission report expressed that “While there are instances of innovation, the landscape is fragmented, various barriers prevent widespread uptake, and fully-fledged institutional or national strategies for adopting new modes of learning and teaching are few and far between” (Vassiliou & McAleese, 2014, p. 4). More research seems to be needed, and in an attempt to understand structural and educational transformation work connected to the digitalization of medical education, this thesis explores teachers, students and management as they are faced by the challenge of digitalizing the medical program at Umeå University. In so doing, the thesis uses the theoretical framework of cultural-historical activity theory (CHAT; Engeström, 1987; Leont’ev, 1978, 1981; Vygotsky, 1978). CHAT provides an opportunity to study the practice of educating professional physicians as a collective activity that is changed and transformed as part of the collective history of the medical program. An activity is created by individuals acting to reach the object, or goal, of the activity. Here, CHAT focuses on culturally developed tools as mediators of individuals’ actions in the activity (Cole, 1996). Vygotsky (1978) pictured this complex and dynamic mediated act as a three-way interaction between the subject, object and mediating tools. In an expanded version of CHAT, Engeström (1987) added a number of collective forces that regulates the activity. In this thesis, they are the program community involved in the activity, the rules directing the education and the distribution of work among actors in the program.
One main idea to be found in the literature concerning CHAT is that activities do not exist only in the moment, but rather take form, change and transform over longer periods of time (Engeström, 1987). Furthermore, individuals act within longitudinal structures that are historically developed in a specific context. An important point of departure for this thesis is therefore that distance education as a new educational activity is implemented not in a vacuum but rather in a historical program context of medical education. Arguably, as pointed out by Sannino (2008), this means that new tools and activities are implemented in contexts occupied by already existing tools and activities that might dominate and regulate the educational practice in the program (Sannino, 2008; Zhang, 2010; Bound, 2011; Reid, 2014; Hauge, 2014). Consequently, as part of a digitalizing program and institution, actors must probably learn how to integrate new digital tools and activities in relation to already existing tools and activities in the program. One way to analytically understand the digitalization of medical education is therefore to conceptualize this as a long-term transition from face-to-face as a dominant activity in the program to a new, non-dominant distance activity (see Sannino, 2008).

Another main idea of CHAT that is central to this thesis is the changing and transformative aspect of activities (Engeström, 1987) – that is, how a transition takes place as a result of change and even as a transformation of the collective educational activity in the program. From the perspective of CHAT, change and transformation are understood to be driven by historically rooted conflicts and contradictions (Ilyenkov, 1977; Engeström 1987; Engeström & Sannino, 2011), which force teachers, students and management to rethink existing tools and practices when experiencing that they do not work. Resolving conflicts and contradictions calls for structural and educational changes in the collective activity, which in turn force actors closer to a new form of activity – in this thesis understood as the new non-dominant distance activity in the program.

To understand the transition from a dominant face-to-face to a non-dominant distance activity in the medical program, teachers’, students’ and management’s ways of dealing with conflicts during the transition will be explored. Moreover, the thesis will explore how these actors initiate structural and educational transformation work aimed at solving those conflicts. This puts a focus on how the interplay between conflicts and structural and educational change over time can assist actors in the program to elaborate on collective solutions to conflicts. Finally, it examines how such interplay can bring about a complete transition from face-to-face to distance education as a qualitative new education activity in the medical program.
Aim and research questions
Following the introduction above, this thesis is an explorative and longitudinal study of the digitalization of medical education. Its specific aim is to describe, analyze and understand structural and educational transformation work in medical education when making a transition from face-to-face to distance education by means of digital technologies and TEL. Drawing on CHAT, the aim is further to explore the interplay between conflicts and changes as they occur over time for teachers, students and management in a regionalized medical program in Sweden. The following research questions are raised:

1) What are teachers’ and students’ expectations pending the transition and what are the influences of already established tools and activities on the program?

2) In what ways do conflicts and changes occur over time, and how do teachers, students and management deal with these as part of the transition?
2. Previous research

This chapter describes previous research that frames and contextualizes the overall aim and research questions in this thesis. The chapter begins with an outline of the development of distance and regionalized medical education. Following that, a review of research examining aspects that influence the transition from face-to-face to distance education is provided. The chapter ends with some methodological implications in the light of previous research.

Distance and regionalized medical education

Beginning in the early 1880s, distance education programs grew out of the educational needs of those pupils and students who could not be in the same time and place as their teacher (Lewis, 1986; Andersson & Simpson, 2012; Moore & Kearsley, 2012; Naidu, 2014). The aim of distance education was therefore to expand the educational practice from the four-wall classroom by “make it accessible to anyone who wanted and/or needed it” (Naidu, 2014, p. 263).

In the literature concerning distance education, a reoccurring theme over the years has been the importance of managing the flow of information and communication between teachers and students without the need for anyone to change geographical location. For that to be the case, both in the past and today, requires some kind of technology (Keegan, 1980; Naidu, 2014). In the early days, as Naidu puts it, this often referred to “some sort of printed study materials” (p. 265) sent between teachers and students by means of posted mail. At the same time, as Naidu argues, while this method provided great opportunities for students to access learning materials, it also introduced flaws for those students craving additional knowledge. Thus, in tandem with technological development, the perceived flaws forced new and more flexible digital tools such as multimedia, audio and video conferencing and later, online learning resources (Moore & Kearsley, 2012). According to Naidu (2014), the effectiveness and usefulness of new technologies for distance education, in turn, increased the status of distance education, which started to be “seen as not only a viable mode of learning and teaching . . . but one that is equally effective and highly regarded in terms of parity of esteem” (p. 265). In turn, the distance education concept started to spread to a wide range of schools and universities to improve the quality and accessibility of learning for a larger crowd of people in the different corners of society (Naidu, 2014).

According to Moore and Kearsley (2012), the growing demands for accessibility and flexibility in education have brought distance education to the attention of several scientific disciplines. For example, in the early 1970s,
influenced by the articulated rural medical workforce crisis, RMPs started to emerge as a new distance education concept in medical education (Verby, 1988; Maley, Worley and Dent, 2009). By expanding the medical program to be conducted in a larger number of hospitals outside urban cities, the RMPs created new possibilities to increase the number of students and at the same time enhance their knowledge of rural and remote medicine (see also Worley et al., 2004; Eley & Baker, 2009). In broad terms, the main reason for this is said to be three-fold. First, changes in patients’ expectations for medical care to be accessible closer to the home community required enhancement of the workforce as well as knowledge of and research on rural and remote medicine (see for example Maley, Worley & Dent, 2009). Rural and remote community hospitals were hereby expected to act as representatives of medical practice with the aim to improve students’ skills and knowledge of rural medicine. Second, students’ participation in rural and remote areas was expected to facilitate rural and remote hospitals’ recruitment of future professional physicians (see for example Worley et al., 2000). This involved rural and remote hospitals in highlighting the benefits of rural and remote medicine and the positive aspects of staying for employment in a specific area. Third, the workforce crisis had for a long time called for an increasing number of graduated physicians, especially in rural areas of countries and continents (Maley, Worley & Dent, 2009).

As pointed out by both Verby (1988), Maley, Worley and Dent (2009) and Snadden et al. (2011), for RMPs to support students from a distance, smaller regional campuses within or close to each remote hospital are often developed. Connected to those regional campuses is often an academic competence and administrative staff that can support students’ learning (Snadden et al., 2011). When developing RMPs and regional campuses, one major challenge, as Topps and Strasser (2010) put it, “continues to be, the integration of non-academic clinical faculty and non-academic hospitals focused almost exclusively on patient care, into new educational and academic roles” (p. 20). Topps and Strasser (2010) and Snadden et al. (2011) mean that even if a fair amount of remote hospitals have previous experience with shorter clinical placements, regionalization demands an academisation of hospitals due to their becoming regional campuses. To secure comparable academic learning experiences in all campuses, both Topps and Strasser (2010) and Snadden et al. (2011) suggest that an infrastructure of academic competence, as well as the practice of an academic rationale and development of a scientific research environment, needs to be developed. In underserved hospitals and local communities, this often involves the recruitment of professional physicians and academic staff who can strengthen the specific medical knowledge in the specific hospital. Further, there is a need for staff who can secure the practice of an academic rationale in the medical education program.
Despite the development of regional campuses, Snadden et al. (2011) argue that one particular challenge for smaller community hospitals has been to provide medical students with appropriate core clinical experiences and sufficient theoretical knowledge to become professional physicians. Consequently, this has required RMPs to move away from the location-dependent campus format to support students’ learning through distance education by means of digital technologies and TEL.

**Digitalizing higher and medical education**

Since the early 1980s, a variety of definitions has emerged that describes different modes of distance education. Among these are e-learning, online learning, open learning, flexible learning, blended learning, net-based learning and distributed learning (Paine, 1989; Naidu, 2014). In these modes of distance education, TEL refers to all forms of teaching and learning in which digital technology is used to enhance learning in distance education (Laurillard & Masterman, 2010). The advancement of technologies and TEL have also presented possibilities to organize medical education in new ways and to support medical students’ distance learning (Dror, Schmidt & O’Connor, 2011; Cook, 2009; Cook et al., 2010). For example, Jwayyed et al. (2011) and Messaoudi et al. (2015) suggest that the Internet and related digital resources, which are now easily accessed in medical students’ homes, classroom environments and clinical learning settings, have increased the access to learning materials and changed the ways in which medical content can be taught and learned. Several research studies report how medical students can participate in TEL activities together with teachers and students located in other hospitals (Baker, Eley & Lasserre, 2005; Srivastava et al., 2014). Moreover, the development of TEL has made possible better learning experiences, enhanced flexibility in students’ learning and less time spent for students in travelling to urban university campuses and hospitals to undertake classroom coursework (Messaoudi et al., 2015).

Educating medical students at a distance requires digitalization of programs and courses (Mason et al., 2014). In the field of medical education, however, there are different research-based opinions as to what extent program and courses have been digitalized (see for example Nestel et al., 2010; Ellaway, 2011; Mason et al., 2014). Ellaway (2011) argues that several parts of medical curricula have been digitalized, but that an uneven use of TEL can be seen in the daily practice of programs and institutions. Studies show, for example, that digitalization primarily involves rather static digital materials for medical students to access (streamed lectures, PowerPoints, case instructions, schedules etc.), while the case seems to be different when it comes to more interactive TEL solutions (seminars, cases, online discussions etc.; Ruiz, Mintzer & Leipzig, 2006; Cook et al., 2010; Lewis et al., 2014).
In the literature, it is also shown that when digitalizing programs and developing conditions for TEL, the focus is often directed towards the selection of different technologies to replicate and deliver existing practices (Blin & Munro, 2008; Eynon, 2008; Dror, Schmidt & O’Connor, 2011; Mason et al., 2014; Kirkwood & Price, 2014). For example, Moore and Kearsley (2012) claim that many programs and institutions “try to fit distance education into the older, established systems” (p. 1) without adapting the education to a new distance format. In the field of medical education, Mason et al. (2014) argue that this is because many “medical programs are hesitant to move training from traditional ‘brick-and-mortar’ classroom settings” (p. 333). However, in the broader field of higher education, Chaloux and Miller (2014) claim that “While an institution’s initial focus might be on the technology of delivery, once a program is up and running, other questions become critical” (p. 13). Buchan (2011) among others puts forth that “If an educational organisation truly embraces learning technology as strategically important to its future, then it will need to do more than choose and implement new systems and applications. It will need to prepare to undergo significant transformation in a variety of areas to support the vision for learning and teaching” (p. 170). In the field of research, this transformation work connects to several aspects of education, such as changes in the structure of programs and courses, changes in the division of labour between actors, and deeper educational changes in how education is conceived, designed, and delivered effectively in order to make TEL possible for distance-learning. Buchan (2011) continues, “the adaptability of the organisation and capacity to predict, plan for and support ongoing changes in learning technology is an important part of realising the transformational potential and effectiveness of learning technology” (p. 170).

Amirault (2012) puts forth that digitalization, as part of the transition to distance education, “certainly promise much advancement for the higher education world, but they also herald a period of unpredictable change for the very institutions that provide that education” (p. 254). Moore and Kearsley (2012) in turn state that structural and educational transformation work connected to the digitalization and transition to distance education involves all levels of the university and needs to be a collaborative effort. The transition incorporates not only academics, who traditionally have been responsible for development of courses, but also students, management and other academic staff within programs and institutions. To understand the transformation work connected to the transition to distance education, researchers have therefore argued that distance education needs to be studied and evaluated as a system including its subsystems of teachers, students and management, including the tasks and work required for each one of them. If following Moore and Kearsley (2012), all parts of the system have central roles in making the whole system work effectively. Furthermore, the better these subsystems
collaborate and are coordinated, the greater the effectiveness of distance education will be. Thus, when studying the transition to distance education, Moore and Kearsley (2012) highlight that “Although we may choose to study any of these subsystems separately, we must try also to understand how each impacts the others” (p. 10). Despite such field-related comments, few research studies in fact seem to combine all levels when trying to explore, describe and understand the transition to distance education. In the forthcoming sections, conflicts, changes and transformation work will be in focus as they occur at the different levels of teachers, students and management as they try to integrate TEL and make a transition to distance education. This is followed by a short discussion of how these levels seem to influence each other throughout the transition.

**Teachers**

When digitalizing programs and making a transition from face-to-face to distance education, there are strong suggestions in the research that teaching activity needs to undergo substantial changes for TEL to be possible (Sandars, 2009; Holmgren, 2014; Kirkwood & Price, 2012; 2014). For example, Dror, Schmidt and O’Connor (2011) argue that many teaching activities do not appear to be originally designed to be delivered in a distance mode and thus need to be redesigned to fit distance education. Several research studies here point to teachers as having the main responsibility for conducting such changes (Beetham & Sharpe, 2013; Delgaty 2013; 2015). For example, researchers point to a need for change in the division of labour between teachers and students (Craig et al., 2008; Goodyear & Retalis, 2010; Laurillard, 2012), in how education is designed and delivered (Kirkwood & Price, 2008, 2014) and in the educational norms and traditions that frame and direct education (Sannino, 2008).

Often of concern in the literature is also that teachers need to learn how to integrate digital tools in a sufficient way to mediate TEL in distance education (Masters & Ellaway, 2008). Sandars (2009) states that a “clear message to educators is that technology in the curriculum has to be carefully planned” and that the “technology is not merely something added onto an existing course but is an integral part of how the course is delivered” (p. 399). In the same line of reasoning, Kirkwood and Price (2008) and Masters and Ellaway (2008) stress that university teachers need to learn how to integrate digital tools and digital learning materials into the curricula, so it becomes understandable for students how such tools can mediate the learning goals in their education. Put differently, students need to acknowledge digital tools and TEL as beneficial for their learning and study outcome (Wong et al., 2012).
According to Biggs (2003) and Kirkwood and Price (2008), one way of dealing with these issues is for teachers to design for and make visible the constructive alignment in courses. Biggs (2003) describes constructive alignment, whereby “a good teaching system aligns teaching method and assessment to the learning activities stated in the objectives so that all aspects of the system are in accord in supporting appropriate student learning” (p. 11). According to Kirkwood and Price (2008) as well as Rogerson-Revell (2015), to create constructive alignment in a course when implementing new digital tools often requires teachers to reconsider and transform the way educational practices has previously been planned, designed and delivered.

In a similar line of reasoning, Kirkwood and Price (2014), say in a critical research review, that to make TEL possible, teachers might have to undertake comprehensive transformation work in established tools, routines and practices to better fit distance education. However, Kirkwood and Price (2014) continue by underlining that transformation work and redesign when making a transition to distance education is important for TEL but rarely appears to be the primary focus in either research or practice. The research targeting distance education and TEL sheds light on a number of conflicts for teachers to develop TEL and making a transition from face-to-face to distance education. One example is the limited time and insufficient competence for making structural and educational change in the teaching activity (Bound, 2011; Laurillard et al., 2013; Kirkwood & Price, 2014). Alur, Fatima and Joseph (2002) argue, for example, that a difficulty in medical education is that teachers are often being trained as medical professionals and not as digital and educational specialists. Consequently, this means that taking on structural and educational transformation work connected to the transition requires teachers to move beyond their traditional boundaries of knowledge and expertise (see for example Basaza, Milman & Wright, 2010). As Lewis et al. (2014) also argue, “Unfamiliarity with online pedagogy and instructional design creates barriers to a smooth transition to this new environment” (p. 159).

Another conflict of interest for this thesis to discuss is the increased pressure on teachers to reevaluate their traditional role as a teacher and to learn about, integrate and use technologies to support students’ learning (see for example Mohamed, 2010). McQuiggan (2007) puts forth that many teachers experience a conflict regarding their limited control over the teaching activities due to the fact that students’ learning to a larger extent is mediated by digital technologies. Moreover, their professional role as teachers appears to change from being a subject expert to being a digital novice (McQuiggan, 2007). This has in turn resulted in teachers’ conflicting motives when taking on a transition to distance education (compare Mohamed, 2010).
Students

Several researchers claim that making a transition to distance learning presents a unique possibility for students to plan and conduct their studies in new flexible ways (Dzakiria et al., 2013; Mahieu & Wolming, 2013; Penman & Thalluri, 2014). Messaoudi et al. (2015) argue that constant access to digital learning materials and TEL solutions in medical education can support students to combine clinical clerkship with theoretical studies in an effective way. This is often related to so-called “just in time” learning, in which students can benefit from studying the theoretical course content online between clinical rounds and patient meetings (see for example Sargeant, 2005; Sandars & Haythornthwaite, 2007; Allen Walls & Reilly, 2008; Nestel et al., 2010). At the same time, though, it is also noted in the literature that making a transition to distance demands a transformation in the role of the learner (Goodyear & Retalis, 2010; Cole, Shelley & Swartz, 2014). Boettcher and Conrad (2010) suggest that the transition often involves a shift from a teacher-centred to a student-centred learning approach in education. As also discussed in the research, this calls for not only structural change in the division of labour between teachers and students but also educational changes in which students need to take control over their own learning processes and develop new learning strategies to benefit from distance learning (Moore & Kearsley, 2012). As argued by Goodyear and Retalis (2010), this in addition requires students to become more self-reliant as learners and largely rely on TEL solutions to mediate their learning.

The research also reveals that transition and transformation work bring a number of conflicts for students. One such conflict is students’ limited trust in digital tools to mediate their learning when they are at a distance. Wang (2014) described in a recent study that several students faced difficulties in making sense of digital learning tools when trying to reach the learning objectives in the course. In turn, this resulted in a widespread skepticism of the distance format and falling attendance throughout the course. Thus, according to Wang (2014), the onus is on teachers to establish a reliable distance-learning context in which students can easily navigate, find and use digital learning materials in order to reach the learning objectives in courses. In the context of this thesis, it can here be noted that studies related to trustworthy environments seem to be rather scarce (see for example Hashem, 2011; Wang, 2014). Liu and Wu (2010), in a recent review, argued that “this is often the most neglected aspect in any effort to design and implement e-learning” and that the challenge related to students’ trust “hasn’t given intensive and extensive research” (p. 121).

Another conflict related to the transition from face-to-face to distance students that has been paid attention to in the research literature is the lack
of sufficient communication and interaction in distance courses. Several
studies have concluded that distance students can benefit from an active and
functioning course community that can help mediate students’ distance
learning (compare Sher, 2009; Pinto & Anderson, 2013; Cole, Shelley &
(2012) claim that achieving engagement and interaction in course
communities can be a challenging task for a program and for courses,
however. Basharinas (2007) displays that different conceptions among
students regarding how to act and express themselves in distance forums can
create conflicts between students during a course. For example, Basharinas
showed that the lack of a sufficient TEL design and guidance for students
created uncertainty and confusion in a student group throughout a course.
This in turn created a conflict for several students, since the distance
interaction failed to mediate the learning objectives in the course. What can
be noted is that while there are a wide range of studies on conflicts related to
online communication and interaction, studies rarely take into account the
impact of program specific factors, such as cultures and conceptions inherent
in programs. What is also less apparent in research is how student conceptions
of their future profession and role as a physician might influence their
participation in online interactions. Moreover, it is not clear how actors
transfer conceptions and routines between different activities, for example of
education and work.

One more conflict of importance during students’ transition is described by
the research as contradictory motives in the program community when it
comes to making structural and educational changes in a distance program
and its courses (compare Boettcher & Conrad, 2010; Gosper et al., 2010). In
their study, Gosper et al. (2010) displayed a conflict between students’ and
teachers’ different attitudes towards the transformation work needed in order
to make TEL possible. This study argues that while students tried and found a
number of solutions to transform their learning activity, the attempts of
change in the teacher team appeared to be less obvious. According to Gosper
et al. (2010), this resulted in experiences of diminished learning experiences,
falling attendance, and fewer transformation efforts among students. Similar
results have been displayed and discussed by Boettcher and Conrad (2010),
who claim that when teachers fail to conduct structural and educational
transformation work in a distance learning activity, students often experience
unsatisfactory learning experiences that result in reduced commitment.
Moreover, students appear to be dependent on teachers’ transformation work
in order to experience positive learning experiences themselves.
Management
The digitalization and transformation work connected to the transition to distance education has also presented unpredictable conflicts for the management of higher education. In times when heavy demands of change and transformation are put on the higher educational system, the management are said to hold an important position in balancing pressure and support for programs and institutions (Miller et al., 2014). By supporting and directing the structural and educational transformational work connected to the transition, leaders are said to impact how the program meets the educational and structural conflicts presented by digitalization (Miller et al., 2014). Despite such knowledge, the management perspective, according to several researchers, is a rather underdeveloped focus in the research on distance education (McKenzie, Ozkan & Layton, 2005; Waters, 2012; Nworie, Haughton & Oprandi, 2012; Croxton, 2014; Miller et al., 2014). Croxton (2014), for example, puts it as research available on the macro perspective of management when digitalizing higher education institutions are scarce. Nworie, Haughton and Oprandi (2012) seem to agree with Croxton when stressing that management of distance education holds a key role in making structural and educational change and making successful transitions to distance education, but knowledge related to skills and competencies for taking on these challenges is unprocessed in the research.

Yadgir (2011), Keppell et al. (2010) and Markova (2014) argue that the management in higher education hold the important responsibility of planning and directing the transformational work during the transition to distance education. This was also pointed out by Croxton (2014), who concludes in a recent study that the digitalization of higher education “calls for strong leadership by individuals who can help develop the strategic changes needed to bring e-learning into the higher education institutional mainstream in a way that supports and promotes student learning outcomes” (p. 62). These factors, Croxton (2014) continues, stimulate digitalization and transformation in higher education. A conflict for many higher education programs, however, is that the management is often inexperienced in leading digitalization of programs and courses (Miller et al., 2014). Such inexperienced management often face difficulties in leading change, taking critical decisions and producing quality in online and distance programs (Benke et al., 2014). These researchers further argue that lack of confidence and experience impedes their attempts to take a leadership role as change agents in the educational context. According to Miller et al. (2014), this has also been a reason for conclusions made in research pointing to a large number of educational institutions that are not being prepared to deal with the challenges that come with digitalization.
One conflict for management, reported on by McKenzie, Ozkan and Layton (2005), is the heavy academic workload of leaders and thus the limited time to engage in the professional development. Chaloux and Miller (2014) report from a study on five different institutions how none in the management had grown up in the digital age. Thus, the authors found that few members of the management had formal education and experience in leading distance education and that most of them “had more traditional academic career paths that led to online administration” (p. 35). Chaloux and Miller further claim that the combination of limited time, knowledge and familiarity with the distance education format influences how management of higher education respond to leadership challenges. Moreover, those issues often cause heavy workload and even unmanageable situations for the management.

Another demanding conflict, according to Otte and Benke (2006), is that management of distance and higher education operate in a time identified by rapid societal changes while working in educational contexts that function at a somewhat slower pace. Amirault (2012) here means that the management of higher education need to take the leading role as change agents by predicting and planning the transformational work and outlining the steps necessary to bring about educational and structural change. In line with Amirault (2012), Kirkwood and Price (2008; 2014) argue that the management need to provide academic staff with time, support and professional development to alter the previous design and structure of education. Hauge (2014) in his turn describes this need to include “convincing teachers and students of the usefulness, not only of tools for learning within existing designs, but of new designs for learning as well” (p. 313). A typical conflict reflected on in the research seem though to be the resistance to change and transformation among academic staff in the program community (Basaza, Milman & Wright, 2010).

Yet another conflict seldom to be acknowledged in the research is how to predict and plan for enhanced workload when making a transition to distance education (Gregory & Lodge, 2015; Moore and Kearsley, 2012). For example, Gregory and Lodge (2015) found that programs and institutions often appear to be surprised by unexpected conflicts, which lead to increased workload during the transition. According to Gregory and Lodge (2015), unexpected conflicts often arise because of management’s difficulties predicting and planning for upcoming challenges in the transition and because of the often limited competencies and experiences in the program community to handle these. Moreover, depending on the magnitude of conflicts, the increased time and effort for solving them often needs to be balanced alongside or even on top of the ordinary academic workload of teachers and management. Put differently, this means that a transition to distance education can be an extremely demanding process for higher education programs. Gregory and
Lodge (2015) therefore argue that unexpected conflicts and the enhanced academic workload generated, must become part of research and the practical planning of transitions and structural and educational transformational work (Gregory & Lodge, 2015). However, this multidimensional task of leading and planning for a transition makes the role “extremely complex and demanding in nature” (McKenzie, Ozkan & Layton, 2005, p. 1) and places heavy demands on the management to take important decisions that might have a major impact on several components of education.

**The influence of the educational context**

The aim of this section is to present research that examines how features in the program context influence the transition from face-to-face to distance education. In a number of empirical studies, claims are made that new distance learning activities are implemented not in a vacuum but rather in an existing program context, regulated by already existing tools, cultures and traditions (Sannino, 2008; Zhang, 2010, Bound, 2011, Reid, 2014, Holmgren, 2015). The focus in research is for example how educational practices and traditions unfold as norms and values that regulate how education could and even should be conducted (compare Kirkwood, 2009; Zhang, 2010). Moreover, it is examined how such traditions influence the integration of new distance activities into everyday practice (Kirkwood, 2009; Kali, Goodyear & Marksuskaite, 2011; Bound, 2011; Hague, 2014; Holmgren, 2014). According to Clarke-Midura and Dede (2010), this also includes how digital technologies might challenge previously and historically rooted traditions and practices in education.

In a study examining the implementation of TEL in education, Zhang (2010) describes the influence of educational cultures as historically and contextually anchored conceptions and practices of education shared by the academic staff in the program community. Zhang explains the educational culture as a complex system including macro-level properties and micro-level components that influence and regulate the program context. The macro-level properties characterize the educational culture as a whole, including epistemological conceptions of education, conceptions of what characterizes an educated person in this particular culture, and power structures regulating the division of labour between teachers and students in the program. The micro level is associated with particular components in the educational culture, including the curriculum and design of education, guidelines, learning objectives, activities and procedures, and learning tools used for mediating the learning activity. Zhang (2010) suggests that this educational culture “shapes the needs for technologies” and that teachers often choose a learning tool “that is consistent with their exiting culture” (p. 233). Consequently, this means that the educational culture may have to change if
there is an aim to integrate new digital technologies and conduct sustainable change in learning activities to fit distance education. Importantly, however, as Zhang further displays, the macro and micro levels of educational culture significantly influence each other, which means that such change needs to be considered at both levels if aiming for sustainable educational and structural change.

Hauge (2014) provides an analysis of how digital tools as new mediating tools can be difficult to integrate into an existing program context. A conflict displayed in his study is that new digital tools “might not fit the history of education and the design of schooling” (p. 312). Thus, similar to Zhang (2010), Hauge argues that teachers might have to reconsider previous and historical designs and conceptions of education in order to integrate new digital tools in the teaching practice. Another conflict displayed by Hague is that new digital mediating tools never seem to work alone in education. Rather, those digital tools are often implemented into program contexts “filled with other ‘technologies’ for communication and learning” (Hauge, 2014, p. 312). As noted by both Hague (2014) and Sannino (2008), this means that programs and institutions are given the challenging task of learning how to integrate the new digital tools within, and in relation to, already established tools, activities and traditions in the program context (Sannino, 2008). Another point in the discussion carried out by Hague (2014), among other researchers (see for example Sannino, 2008; Warschauer & Matuchniak, 2010), is that some of these mediating tools can be more dominant and historically rooted than others in the program context. This also means that new digital tools can be forced to compete with other, rooted tools in order to be integrated in the educational practice. Consequently, this also puts new digital tools at risk of not being further implemented in the educational practice (Hauge, 2014; Sannino, 2008).

The research results reported above reveal how program contexts, including predefined tools, traditions and practices of education, influence digitalization and transitions to distance education. Moreover, previous traditions and practices might have to change in order for new mediating tools and practices to be implemented and used in medical education. In a study following five universities’ transitions to distance education, Chaloux and Miller (2014) argue that educational traditions and cultures could change, but it “is not easy, especially if you have an existing traditional campus culture to change” (p. 35). The authors further argue that “establishing a culture around an online program within an institution where one already exists is difficult and ongoing” (p. 33). In the same line of reasoning, both Zhang (2010) and Kirkwood (2009) argue that substantial and sustainable change in educational cultures and traditions is difficult, takes time and requires actors
to engage in a discussion of traditions associated with the existing education. Few studies, however, seem to have so far focused on change in educational traditions and practices from a longitudinal perspective, especially in terms of embracing the levels of teachers, students and management when making a transition to distance education. In addition, and maybe even more seldom, the focus has been on the hierarchy of different educational cultures and traditions within an educational program context (see for example Sannino, 2008).

**Methodological implications in the light of previous research**

The digitalization of higher and medical education bring about a wide range of conflicts and changes that need to be addressed not only in the program as a whole but also in the various levels of teachers, students and management (Moore & Kearsley, 2012; Miller et al., 2014). Recent research indicates, for example, how students’ transformation work towards becoming distance learners is constantly influenced by other nearby systems of those such as teachers and management of programs and courses. According to the literature, students seem to be highly dependent on teachers’ transformation work to themselves make a transition to distance learners and to experience positive learning experiences at a distance. One limitation in the previous research that is of methodological interest in relation to this thesis is that few previous studies seem to have been conducted with an attempt to understand the digitalization and transition to distance education by actually combining results from all levels; that is, teachers, students and management. Consequently, there seem to be is limited knowledge available on how a transition to distance education evolves as a collaborative effort in education. Moreover, such knowledge could inform programs and institutions as they plan and prepare for a transition as a collaborative effort of structural and educational transformational work.

Another interest after going through the previous research is that a large body of medical educational research uses comparative and quantitative research designs. Other researchers in the field of medical education have also identified this methodological gap and deficiency (see for example Ellaway & Masters, 2008; Cook, 2009; Cook, Garside & Levinson, 2010; Cook, Levinson & Garside, 2011). A closer look at some of the critique of research that has focused on digitalization in medical education reveals that a previous challenge has been “the domain’s commitment to the positivist tradition that still tends to employ and value quantitative over qualitative methods” (Ellaway & Masters, 2008, p. 486). Cook (2009) argues for example that a large body of medical educational research uses research designs that in particular aim to measure and prove the efficiency of TEL. One reason for this, according to Ellaway and Masters, is that the “rush to measure, and thereby
prove the utility of e-learning” is “driven by political as well as scholarly motives so as to ensure its place in medical education” (p. 300). Although the knowledge that is produced by the use of such research designs is rather important, journal editorials have called for critical approaches and qualitative research designs that can problematize and produce rich descriptions of conflicts, challenges and change related to the transition to distance education and the development of TEL (see for example Cook, Levinson & Garside, 2011). Yet another interest in the light of this thesis is the limited use of theories to inform medical education research. In short, few studies seem to be guided by an explicit theoretical framework (see for example Cook, Garside & Levinson, 2010). In their systematic review, Cook, Levinson and Garside (2011, p. 766) explain the sparse use of theoretically informed studies with reference to the limited awareness and knowledge of existing theoretical frameworks among researchers in the field of medical education.

Before moving on to the next chapter, it shall be said that this thesis attempts to answer to the research-based calls for new ways of investigating medical education. Using a longitudinal design mostly based on qualitative data, the analysis provided in this thesis attempts to produce rich descriptions of the digitalization of medical education. The use of CHAT is further expected to allow combining aspects of a longitudinal perspective, multiple levels of actors and a rich set of data with the aim to be able to present a more diverse and nuanced analysis of the transition than seems to have been possible so far. Put differently, it aims to further problematize and produce a higher level of abstraction in the analysis of the digitalization of medical education (compare Selwyn, 2011; 2012).
3. The context of medical education

As noted in the previous chapter, digitalization and transition to distance education seldom take place in isolation, outside of previous contexts and practices inherent in educational program and courses. With that in mind, the purpose of this chapter is to make visible the influence of the history and context relevant to this thesis. This will be done by framing and contextualizing the distance education format of the medical program at Umeå University in three steps. First, it presents the broader context of medical education in Sweden and at Umeå University. Second, it provides a historical outlook on the dominating traditions and routines that have permeated the medical program over time, both internationally and nationally. Third, it describes the development of the RMP and how it made digitalization a prerequisite due to the teachers’ and students’ being distributed in regional campuses in northern Sweden.

The medical program in Sweden

At Umeå University in Sweden, the digitalization and transition to distance education involve the undergraduate medical program in general and specifically the theoretical education in the program. The medical program in Sweden is a higher education program leading to a medical diploma (Degree of Master of Science in Medicine) (Umeå University, 2014; The Swedish Medical Association, 2012; The National Board of Health and Welfare in Sweden, 2014). The medical program comprises 330 ECTS conducted during 11 semesters over 5.5 years. The undergraduate medical program is followed by 18 months of general internship, which leads to a general license to practice medicine (The Swedish Medical Association, 2012). To earn a specialist competence in medicine, another five years of specialist training are required.

There are seven undergraduate medical programs in Sweden (The Swedish Medical Association, 2012). They are all located in urban cities, mainly in the middle or south of Sweden. They observe the same national diploma objectives (The Swedish Council for Higher Education, 2014a), even though variations in content and delivery of the curriculum are common (The Swedish Medical Association, 2012). The Swedish Higher Education Authority (2012) has the responsibility to both regulate and evaluate the quality assurance in the medical programs in Sweden. Admission to the medical program takes place twice a year. The competition to receive one of the training posts is high. In 2014, 39,000 individuals applied to one or more of the seven medical programs in Sweden (The Swedish Council for Higher Education, 2014b). Out of these, 900 (2.3%) were admitted to one of the seven medical programs.
Since 1957, the Faculty of Medicine at Umeå University has administrated one of the medical programs in Sweden (Umeå University, 2014). The medical program board at Umeå University is primarily responsible for controlling and administrating the medical program. The main responsibilities of the board are presently in broad terms to prepare budget proposals and take economic decisions within the assigned budget; decide on vacancies in the program, revise and define curricula, evaluation and quality work in the program and its courses; decide on organizational and educational coordination in the program etc.

The medical program in Umeå comprises two somewhat separate parts; the “pre-clinical” (semester 1-5) and the “clinical” (semester 6-11, except for the tenth semester, when students write their master level essay) (see Table 1 below). Each semester practically always consists of one course. For each semester, one or two responsible teachers coordinate the educational and structural work of the different subjects and make necessary decisions that concern the specific semester, including marking of the students’ examinations.

Table 1. An overview of courses in the medical program at Umeå University.

<table>
<thead>
<tr>
<th>Pre-clinical semesters (1-5)</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introductory course</td>
<td>3 ECTS</td>
</tr>
<tr>
<td>The structure and function of the cell</td>
<td>27 ECTS</td>
</tr>
<tr>
<td>The structure and function of the organ systems</td>
<td>46.5 ECTS</td>
</tr>
<tr>
<td>Attack and defense</td>
<td>13.5 ECTS</td>
</tr>
<tr>
<td>Pathology, symptoms and diagnosis</td>
<td>30 ECTS</td>
</tr>
<tr>
<td>Clinical propaedeutic</td>
<td>30 ECTS</td>
</tr>
<tr>
<td>Clinical semesters (6-11, including master thesis)</td>
<td></td>
</tr>
<tr>
<td>Clinical course 1 (medicine)</td>
<td>30 ECTS</td>
</tr>
<tr>
<td>Clinical course 2 (surgery, anesthesia, urology, malignancy)</td>
<td>30 ECTS</td>
</tr>
<tr>
<td>Clinical course 3 (orthopedics, infection, skin etc.)</td>
<td>30 ECTS</td>
</tr>
<tr>
<td>Clinical course 4 (psychiatry, neurology, ear-nose-throat, eyes)</td>
<td>30 ECTS</td>
</tr>
<tr>
<td>Master thesis/essay</td>
<td>30 ECTS</td>
</tr>
<tr>
<td>Clinical course 5 (Woman/child)</td>
<td>30 ECTS</td>
</tr>
</tbody>
</table>

The Medical program board is in a hierarchical order governed and directed by the Faculty of Medicine, the Education Strategic Board and the Programme Chairman Council.
The first part of the program, semesters 1-5, consists of basic medical science courses, laboratory medicine, pharmacology and propaedeutic parts; mainly theoretical elements that work as a foundation for the forthcoming clinical practice. The second part, which is the focus of this thesis, semesters 6-9 and 11, consists of the students’ clinical clerkships. These embrace a number of rotations in urban or regional hospital clinics and primary care centers. During these clinical semesters, theoretical classroom-based coursework and cases are integrated in the courses.

The next section will elaborate on the historical development of the medical educational practice and program curriculum structure. This includes traditions, structures and routines for medical education as it appears internationally and nationally.

**The medical educational practice**

In conformity with other medical programs worldwide, the Swedish medical curriculum has primarily been guided by medical research and the health care system. In particular, this means that the program and curriculum are structured based on different disciplines such as microbiology, anatomy, physiology and pediatrics (see for example Cooke, Irby & O’Brien, 2010). Such structure can be found also in the Flexner model of medical curriculum that until the 1960s recommended what was called a discipline-based curriculum design (Cooke, Irby & O’Brien, 2010). That kind of design meant that each discipline remained responsible to define, teach and examine its specific subject in the medical program, often without having to coordinate with other disciplines or the overall aim of the program (Cooke, Irby & O’Brien, 2010). The discipline-based curriculum design was rather attractive among teachers and stakeholders, since teachers’ identity, research and health care positions often originated from a specific discipline. This also meant that programs and curriculums could easily be inspired by and adapted to teachers’ own research and the overall structure of the health care system (Lindgren & Danielsen, 2007). This curriculum design also had implications for the theoretical teaching and learning practice within the medical program. With teachers’ identity strongly tied to a specific subject and discipline, the teaching practice was often guided by the idea that “‘teacher know all’ and ‘students only know what the teacher teaches’” (Mohamed, 2010, p. 5). The transmitting of knowledge in the classroom setting was perceived as a successful tradition that made it easy for teachers to control and direct the teaching situation (Irby, Cooke & O’Brien, 2010). This also meant that traditional lectures supported by textbooks and compendiums often guided the teaching practice (Cooke, Irby & O’Brien, 2010). That learning often comprised the memorizing of medical science, and students’ knowledge was tested and controlled in different content- and knowledge-based tests and examinations.
Over the years, both discipline-based curriculum design and communicating of knowledge through classroom-based lectures started to raise concern (Irby, Cooke & O’Brien, 2010; Cooke, Irby & O’Brien, 2010) that “the pedagogies employed in the discipline-based model often rely heavily on lectures that do not actively engage learners in constructing conceptual understanding” (Cooke, Irby & O’Brien, 2010, p. 78). This also meant that medical students had to use learning strategies of memorizing medical facts instead of engaging in more student-active and process-based learning activities, such as practicing and discussing medical science (Cooke, Irby & O’Brien, 2010). Other articulated problems related to the discipline-based curriculum design were students’ frustration with information overload. This was a result of limited coordination between subjects and disciplines (Cooke, Irby & O’Brien, 2010).

These articulated problems produced a climate in which a need for change was expressed. At the very core of this pressure was an expectation of medical education to move towards more integrated curriculum designs and more student-active learning approaches. With regard to this need, during the last decade there have been several international attempts to move away from the discipline-based curriculum design and the classroom-based lecturing with the teacher at the front of the classroom. Starting in the early 1970s, new educational approaches of process-based and student-active learning solutions that more effectively could engage the medical students in the learning activity were developed to various degrees in different continents and countries (Neufeld & Barrows, 1974; Cooke, Irby & O’Brien, 2010). This movement also included an enhanced use of integrated curriculum design that largely could connect theoretical and practical elements of medical education. As a means to permit such structural and educational changes in the learning activity, a number of efforts and strategies have over the years been developed and implemented worldwide. Tools perceived as having the potential to enable such change have for example been the development of digital learning materials and TEL (Cooke, Irby & O’Brien, 2010). For example, through allowing recording and uploading lectures online, the digitalization of medical education has been expected to make it possible to reduce classroom lectures to benefit other, more interactive student learning approaches through TEL. However, despite such possibilities, as discussed in Chapter 2 above, many medical programs still struggle with the digitalization and use of TEL for education.

This need for change towards more student-active learning solutions and integrated curriculum designs has also been present in Sweden and at Umeå University. For example, in 1992, the management of the medical program at Umeå University called for enhanced integration of theory and practice in the
curriculum and the development of more student-active approaches. The result was seminars and case-based methods that moved beyond traditional classroom-based lectures. This vision of development was also present in the curricula, launched in 2000, which expressed that “the students should learn to actively search for knowledge, and have a critical and comprehensive approach to their profession”, and furthermore described the aim to “stimulate the student’ own activity combined with regular opportunities for reflection” (The Faculty of Medicine, 1998, p. 4). In the latest curriculum, implemented in 2007 (The Faculty of Medicine, 2011), the aim was to keep moving towards enhanced integration of pre-clinical and clinical education and to facilitate the process-based elements and student-active approaches through for example case-based methods.

This historical development is a reflection of a culture and tradition of theoretical classroom-based coursework that historically has been present at the medical program in Sweden and Umeå University. This norm for how professional physicians can and should be educated also appears to be historically rooted in the program. Despite the gradual movement towards other forms of theoretical teaching and learning, the medical program at Umeå University, like many other medical programs worldwide (compare Cooke, Irby & O’Brien, 2010), still seems to be characterized by the historical and predominant paths of traditional lectures and classroom-based teaching and learning. Even though traditional classroom lectures have decreased at the medical program in Umeå, the use of books and compendiums and traditional lectures is still the predominant format for theoretical learning (compare The Faculty of Medicine, 2011).

In the following section, the development of the RMP at the medical program at Umeå University will be accounted for, as well as how this RMP made digital technologies and the distance education, as a new educational format, a prerequisite for theoretical teaching and learning in the program. Moreover, how this transition has required the program to rethink the traditional classroom-based theoretical teaching as a result of having medical students distributed at regional campuses in northern Sweden will be presented.

**Regionalizing the medical program**

Similar to many other countries in Europe (OECD, 2012), Sweden has for some time faced an increasing shortage of physicians (The Swedish Government, 1991/92; The National Board of Health and Welfare in Sweden, 2010). This is particularly the case outside of the more populated areas, in northern Sweden (The Swedish Government, 1992/93). This shortage has led to an increase of the admissions to the medical programs and gradually called
for new ways of educating larger groups of medical students beyond the traditional campus-based programs.

In 2007 and 2008, two Swedish government decisions (The Swedish Ministry of Education and Research, 2007, 2008) proposed the need to expand the medical program and to facilitate a regionalization of medical students in northern Sweden: “The expansion at Umeå University will make it possible to start a more decentralized form of medical education that to a larger extent than today will be conducted in the region [author’s translation]” (2007, p 1). For Umeå University, located in northern Sweden, this expansion resulted in 34 new admissions per semester to the medical program.

Based on the government decisions, it was decided to plan for a regionalization of the medical program at Umeå University. Similar RMPs had previously occurred in other continents and countries worldwide (Maley, Worley & Dent, 2009; Snadden, 2011), but not primarily in Sweden. The regionalization meant that Umeå University expanded its campus to three regional hospitals in northern Sweden. The first part of the program, including the basic clinical science (semester 1-5) was conducted as before at the main campus in Umeå (see Figure 1 below). During semesters 6-9 and 11 (during the tenth semester, students write their master level essay), however, approximately 30 medical students per semester are spending their entire clinical clerkship semesters in one of three regional hospitals in northern Sweden (see Figure 1). The exception is shorter placements in Umeå or other hospitals or primary care units during those semesters.

**Figure 1.** Structure of one of the RMPs at Umeå University in Sweden.
Despite the previous experience of shorter clinical placements in regional hospitals, the regionalization forced new demands of adaption and academisation of the regional hospitals due to becoming regional campuses within Umeå University (Naredi & Johnson, 2009). The medical education had for example to be planned and conducted based on an academic rationale which involved constructive alignment in the program and with equal quality between sites. Consequently, this also required academic competence and the need for scientific research environments in all four locations. In accordance with other RMPs internationally (Topps & Strasser, 2010; Snadden et al., 2011), Umeå University had to employ academic staff and local leaders in each of the regional campuses in order to implement the regionalization process. Two medical teachers (holding at least a PhD) per semester and per physical regional campus were therefore employed. This meant 30 medical teachers in total. To support administration and program specific questions on the local level, one administrator was employed at each location.

However, despite the academisation of regional hospitals and the recruitment of academic staff, the insufficient number of subject specialist teachers in the different locations caused difficulties in delivering certain teaching and learning elements in the regional campuses. To enable theoretical teaching and learning between different locations, it was therefore decided that digital technologies combined with distance education would serve as a hub in the program (Naredi & Johnson, 2009; Naredi et al., 2012). This would make it possible to create “equal learning contexts in all the four locations [author’s translation]” and provide the same access to learning materials regardless of location (Naredi et al., 2012, p. 1). To support theoretical teaching and learning at distance in the RMP, a number of digital technologies were further developed and implemented in the program.

To make it possible for medical students to have the same access to specialist teachers, courses and learning materials, a shared technology-based course management system (CMS) was developed and set up (compare Strasser & Lanphear, 2008 p. 4). The program used Moodle as the CMS. The development process was realized as a joint project between the Faculty of Medicine and the Department of Education, both located at Umeå University. As a part of this development, teachers on all four campuses were asked to review related course materials and to record short versions of their theory-driven lectures to be uploaded to the CMS. Educational technologists from the Department of Education supported teachers’ recordings technically and educationally. When the CMS was put into use, it was possible for medical students to access streamed lectures and related PowerPoints, case instructions, grades, schedules and other written course materials. Moreover,
they could submit examinations and communicate with teachers and other students through chat rooms and forums.

To enable cases, seminars and live-send lectures, the educational technologists introduced medical teachers and students to Adobe Connect and a Tandberg video-link system. A number of students in each class were further educated to be technology supporters for teachers during lectures and seminars. The purpose of Adobe Connect was to serve as a system for seminars, cases and other discussions, while Tandberg would be used especially for live-send lectures. Those systems also seemed to provide other benefits; for example, to let the best-suited specialist teacher, regardless of his or her location, take responsibility for lectures and seminars. Other important aspects were to make it possible to have local access to teaching and learning facilities such as local classrooms, study rooms and computer halls (Naredi & Johnson, 2009).

**Summing up**

As described in this chapter, the RMP and distance education by means of digital technologies at Umeå University was introduced into an established medical program with already established structures and routines for education. The historical description of the medical program shows how traditional classroom-based teaching and learning with the teacher physically located in the front of the class have dominated the educational context of the medical program. This has been the case both internationally and nationally, as well as in the medical program in Umeå. The regionalization of the program and relocation of medical students in hospitals remote to the university hospital and campus has however forced the program to digitalize and make a transition to distance education. How this process of a transition can be theoretically conceptualized and captured, is described in the next chapter.
4. Theoretical framework of CHAT

This chapter describes cultural-historical activity theory (CHAT), the theoretical framework used in this thesis for studying the transition to distance education in the medical program. The chapter begins with a brief account of the historical development and the main thrust of CHAT. Thereafter, it will be discussed how the framework will be used to analyze conflicts and change related to the transition.

The first generation of activity theory
CHAT has its roots in Soviet psychology and in the philosophical foundations of Marx, Engels and Hegel (Daniels, 2001). A basic assumption is that human consciousness, environment and activity are inseparable units in the shaping of human beings (Leont’ev, 1981). As a strand of Soviet psychology, Vygotsky (1978) studied human development through individuals’ interactions with historically and culturally developed tools. One important claim of Vygotsky was that learning and development do not just happen to individuals but are actively created through individuals’ engagement with cultural tools and signs when trying to solve different tasks (Vygotsky, 1978, 1981; Daniels, 2001). This implies that individuals can only be understood within cultural environments in which they shape and are shaped by the cultural tools mediating their actions (Cole, 1996). Vygotsky (1978) pictured this complex and dynamic mediated act as a three-way interaction between (1) the subject, (2) the object of the task, and (3) the mediating tools (see Figure 2). This three-way interaction constitutes the notion of mediation.

![Figure 2. Picture of mediation as a three-way interaction between subject, tools and object.](image)

Mediation is what connects the different strands within the sociocultural perspective, and it is in this mediated action that individuals become sociocultural beings. Even so, there is a difference between Vygotsky’s sociocultural perspectives and CHAT. The difference first occurred when Vygotsky’s student Leont’ev further developed the social, collective and contextual
dimension of learning and development, termed the second generation of activity theory (de Lange, 2010; Roth & Lee, 2008).

**The second generation of activity theory**

In developing activity theory, Leont’ev (1978) broadened Vygotsky’s concept of mediated action by introducing object-oriented activity as the proper unit of analysis. According to Leont’ev (1978), individual learning and development is a part of a collective activity with its community, tools, rules and division of labour. Leont’ev further claimed a motivational aspect, meaning that individuals’ mediated actions are oriented towards a shared object, defined as a collective focus or purpose. Lund and Hauge (2011) describe that shared objects “are developed collaboratively, they do not just exist as some common ground for communication” (p. 208). Understanding the object of the collective activity can accordingly say something more about what individuals are doing and why they are doing it (cf. Kaptelinin & Nardi, 2006). Mediated actions that in isolation look irrational and meaningless – such as running after a deer – become obvious when put in a larger perspective of a collective activity with a shared object – such as pitfall hunting. In a hierarchical illustration, Leont’ev (1981) showed how individual actions relate to a collective activity directed towards a shared object:

![Figure 3. Leont’ev’s (1978) structure of an activity.](image)

As shown in Figure 3, an activity consists of a dialectic relationship between activity, actions and operations. Individuals’ actions appear in the middle, and the collective activity constituted by individuals’ actions at the top. An example from the topic in this thesis can illustrate this theoretical way of reasoning. A number of actions are directed towards the object of educating professional physicians: students’ reading books, practicing clinical skills, discussing clinical facts, giving and receiving feedback on assignments. Other examples are teachers’ planning and doing lectures, reading assignments, giving feedback etc. As the activity of educating professional physicians is realized by actions, the actions are in turn realized by routinized operations
oriented towards conditions in the task. Actions of discussing clinical facts mean for example that students have to conduct a number of operations such as reading, speaking and writing. These actions and operations are also what constitute the activity of educating professional physicians. In some respects, these actions and operations can look trivial, but as will be shown in this chapter, these small actions, when they are innovative character, can be of great importance when they slowly put forth change and transformation in the activity.

**The activity system**

According to Engeström (1987), what was missing in Leont’ev’s illustration of the activity was the structure of its boundaries and inner elements. Furthermore, activities does not exist only in the moment, but rather forms and transforms during longer periods of time as a historical existence and development of activities. This is for example how individuals act within longitudinal structures and boundaries, such as medical education contexts. In a graphical model, Engeström (1987) introduced the notion of activity system as a historical and social activity surrounded by its own boundaries and elements of rules, tools and division of labour:

![Activity System Diagram](image)

**Figure 4.** An illustration of Engeström’s (1987) structure of human activity.

The illustration related Vygotsky’s notion of individuals’ mediated action (upper part of the triangle) and the collective and historical level of the activity (lower part of the triangle). The educating of professional physicians, for example, can be interpreted as an activity that has been developed over time. The activity is conducted in a specific program community with its own history, rules, tools and division of labour that regulate the activity. Rules can be explicit, such as course plans, curricula, policies and schedules, but also implicit, such as norms and values of how medical students can and should be
educated. Rules, tools and object is constantly constructed and reconstructed through individuals’ (e.g. in this thesis teachers’, students’ and management’s) actions and operations.

**Dominant and non-dominant activity systems**

In a later version, Engeström (1987) extended the notion of activity systems to include the notion of a network of systems. Instead of a single activity as the unit of analysis, the focus is on the interaction between two or more activities. Engeström (2001) describes change and development to be accomplished within but also between multiple activity systems that represent different voices, skills and traditions. Relating this to the example of educating professional physicians, the face-to-face and the distance activity could be analyzed as two different activity systems; that is, face-to-face activity is the already established activity system, and distance education is the new system to be implemented in the program. The two activity systems are understood to be loosely connected by representing two different traditions for how the education can and should be conducted. Importantly, this also makes it possible to analyze the transition from one already existing activity to a possible new one—that is, the distance education activity.

However, the theoretical framework of CHAT does not seem to provide enough insight into the hierarchy of the interacting activity systems. For example, it does not illuminate how activities might dominate and direct the formation of other nearby activities. According to Paper 3 and 4 in this thesis, for example, the face-to-face activity in the medical program seems to incorporate norms and traditions of education that are more dominant than the ones in the distance education activity. In these two papers, it is possible to assume that the face-to-face activity might dominate and direct the formation of, and transition to, the new distance activity. In a discussion of future development of CHAT, Engeström (2009) presented a number of aspects that could stimulate further work on the theory. One aspect relates to dominant trails and boundaries within a context. Engeström (2009) claimed that within contexts, some paths could be more dominant than others:

Dwellers create trails and the intersecting trails gradually lead to an increased capability to move in the zone effectively, independently of the particular location or destination of the subjects. However, the zone is never an empty space to begin with. It has pre-existing dominant trails and boundaries made by other, often with heavy histories and power invested in them. More than that, the existing trails, landmarks, and boundaries are being both controlled by proprietary interests and opening up possibilities of common good. When dwellers enter the zone, they both adapt to the dominant trails and struggle to break away from them. The latter leads to critical conflicts and double binds. (p. 313)
The interpretation that no context exists as an empty space, free from historical trajectories and pre-existing dominant boundaries and trails, is an important implication for how the transition to new activities should be viewed. As Sannino (2008) expressed, new activities are not implemented in a vacuum. New activities should instead be seen as alternatives to something already existing. This might for example be face-to-face as the obvious and historically rooted way of teaching and learning in the medical program with the power to dominate, direct or even hinder new alternative ways to be implemented. This might also be a historically proven path for subjects to comfortably stay in or return to (Sannino, 2008). This is also an important implication for this thesis.

The transition to the new distance education activity will be understood as the unproven and non-dominant alternative to the dominant and historically rooted face-to-face activity in the medical program. According to Chapter 3 in this capstone, there are also examples of what could be historical and dominating paths and structures embedded in the program. These might also include prescribed norms and ideas about how medical education should be conducted which thus dominate and regulate the formation and transition to the new distance activity, such as classroom-based teaching, books, compendiums, traditional lectures and the teacher in front of the classroom, dominating the education context (compare Sannino, 2008). Worth noticing, however, is that the dominance of activities, according to Sannino (2008), can alter due to learning, change and transformation in educational practices. This will be further elaborated in the following two sections.

**Conflicts and contradictions**

According to CHAT, change and transformation in activity systems is driven by contradictions (Ilyenkov, 1977). Engeström (1987) puts forth that contradictions can occur (1) within elements of an activity system (in tools, rules etc.), (2) between elements in the activity (between tools and rules), (3) between the objects of two activity systems, or (4) between elements of two different but connected activity systems. According to Engeström and Sannino (2011), however, a contradiction can only be analyzed through its manifestations. Examples of manifestations include critical conflicts as contradictory motives or double binds as “two messages or commands, which deny each other” (Engeström, 1987 p. 142). A double bind is a state in which neither of the two options seems possible for the subjects to accept or return to. This in turn calls for a solution as a qualitative third new option or activity—a new ‘germ cell’ (Engeström, 1987). Subjects in the activity system are here driven to question and rethink the previously established activity and its included elements when what is already established does not work. An example in the context of the medical program at Umeå University was the
lack of physicians, which over the years led to an increase in admission to the program. The increased admission made it impossible to educate all students at the Umeå University hospital, which in turn gave rise to a contradiction and the call for a qualitative new way of educating larger groups of medical students beyond the traditional campus-based medical program.

A well-established analytical method in CHAT research is to focus on contradictions in the activity system (Murphy & Rodriguez-Manzanares, 2008; Engeström, 2001; Engeström & Sannino, 2011). Importantly, however, according to Engeström (2001), the root of conflicts and contradictions in an activity needs to be traced and analyzed in relation to the history of the local context and procedures. As explained by Engeström and Sannino (2011), contradictions are “historical and must be traced in their real historical development” (p. 371). In other words, manifested contradictions during the transition to distance education in the medical program should be traced back in time and analyzed in relation to the history of teaching and learning in the program.

When implementing new tools or activities there are also other tensions and conflicts that might arise in the educational practice. In activity systems, emerging tensions and conflicts between subject and tools can occur. This is what Engeström (1987) describes as irreducible tensions between subjects and tools. Such conflicts and tensions are different from contradictions since they occur on the level of actions. Engeström means that they are important because they force change and development in individuals’ actions in the activity. More comprehensive and structural change in the whole activity, however, is forced by conflicts or double binds that are historically rooted in contradictions on the collective level of the activity (Engeström, 1987). Solving historically rooted contradictions therefore calls for change beyond the individual action level. It calls for structural and educational transformation work of the whole activity system. Put in the context of this thesis, this could be seen as a transition from face-to-face to distance education as a transformation in the way education is conducted (compare Engeström, 1987). This will be the focus of the next section of this chapter.

**Change and transformation as levels of learning**

Characteristic of CHAT is the developmental perspective in the theory – specifically the view of transformative collective activities and how the new is generated. This is of importance also for this thesis in terms of how the new non-dominant form of distance education is implemented as an alternative to dominant face-to-face activity, and how this, in turn, drives change and development of educational practice over time.
From a CHAT perspective, change can be seen as a transition from one activity to another, or, as explained by Engeström (1987), as a transformation of the activity system (e.g. when going from face-to-face to distance). The concept of transformation is understood as a result of human learning, driven by contradictions (Engeström, 1987). Engeström described this with the support of Bateson’s (1972) so-called levels of learning. A transformation takes place through three steps. This way of viewing change and transformation – through smaller steps – opens a way to describe an ongoing transition, even if it not results in a complete transformation of educational practice in the medical program (compare de Lange, 2010). Using the notion of levels of learning in this capstone will also be a way of further elaborating on the results generated in the four papers included in this thesis.

The first step in the hierarchy of Bateson’s levels of learning, zero learning, is characterized by a stream of operations that are conducted without certain corrections. Moving from one step of learning to another is termed a transition. Learning I, as a transition from zero learning, refers to the adjustment and formation of operations with “extremely slow and gradual improvement of tools” (Engeström, 1987, p. 145). Learning II, which becomes of particular interest in this study, is a more complex appearance of learning that can indicate important steps of change, even if they do not end up in a complete transformation of the whole activity system. To be specific, Learning II is driven by a conflict in which individuals realize that their methods are inadequate in the activity system. Learning II therefore includes a process of changing individuals’ strategies and methods or searching for new tools and strategies. Learning III represents something larger – a transition from one activity to another or a transformation of the structure of the whole activity. This Learning III is often painfully resolved, requiring a qualitative change in the teaching and learning practice. In addition, according to Engeström, “Learning III is a rare event, produced by the contradictions of Learning II” (p. 141).

Engeström (1987) divided Learning II into two forms: Learning IIa as a reproductive form and Learning IIb as a productive form of learning. Learning IIa represents trial and error, or “blind search’ among previously known means” (Engeström, 1987 p. 148). This means that individuals are using existing tools and strategies to solve problems in the activity. This may for example include attempts to use the old face-to-face methods by means of new digital tools in the new distance-based activity. As also shown in Chapter 2 in this capstone, this can cause problems and conflicts in educational practice. New tools along with old methods can for example cause unproductive and unfeasible teaching and learning situations (compare de Lange, 2010). This in turn requires experimentation with new procedures and methods for
education, as is part of the level of Learning IIb. Learning IIb is characterized by testing and experimenting with new methods and strategies by reflecting and questioning the old. Learning IIb results in deeper structural and educational changes in the activity system, such as new educational designs for educating professional physicians. Engeström states that “productive experimentation of type IIb is a necessary precondition for the fruitful resolution of double binds” (p. 155) and that the “creation of new instruments within Learning IIb is potentially expansive – but only potentially” (p. 149). In other words, Engeström claims that Learning IIb is limited to the level of individual actions but can, when moving to a collective level, result in Learning III as a collective structural and educational transformation of the whole activity system.

Some transitions, from Learning IIa to Learning IIb and especially from Learning IIb to Learning III, are seen as rather unusual steps, since they result in a complete transformation of the whole activity. The latter requires collective learning; individual learning and experimentation alone are not enough. Therefore, as minor components of transitions, this thesis uses Sannino’s (2008) concept of transitional actions as an analytical concept. Transitional actions are not seen as complete transitions but rather as actions of smaller steps of transitions that in a longitudinal perspective can assist in finding collective solutions for conflicts and double binds. These are small, but important experimental actions, which over time can facilitate a complete transition, for example from Learning IIb to Learning III. In this thesis, steps of structural and educational transformation work in the medical program, conducted to successively change and transform the educational practice in the program will be conceptualized as transitional actions. This for example could be teachers’, students’ and management’s actions of experimentation with new tools and designs for distance education. Sannino (2008) further explains how transitional actions can move across activity boundaries. For example, experiences and knowledge can be brought between non-dominant and dominant activity, resulting in small steps of change and transformation. This also means that teachers’, students’ and management’s transitional actions, by experimenting on distance education and TEL, are essential for making a complete transition to distance education.

It is in this thesis reasonable to assume that the transition and meeting between face-to-face and distance education activity in the medical program will create conflicts and double binds in the educational practice. Conflicts and double binds need to be solved in order to put forth a complete transition. Moreover, the common solution of making a transition to distance education by implementing new tools to replicate previous practices (typical for Learning IIa) may be difficult to enact (see examples in Blin & Munro, 2008;
Eynon, 2008; Dror, Schmidt & O’Connor, 2011; Mason et al., 2014; Kirkwood & Price, 2014). To replicate previous practices, as discussed in Chapter 2 above, might for example create conflicts that hinder teachers and students from sufficiently teaching and learning at a distance. Therefore, such a transition might call for structural and educational change beyond new tools and beyond the individual action level. It might call for structural and educational transformation of the whole activity system. This in turn might require transitional actions and a collective effort in the program with the purpose of gradual development of new methods, structures and designs for distance education.

**Summing up – the transition through a lens of CHAT**

As described in previous chapters, in order to solve the contradiction related to the crowding of students at the Umeå University hospital and the demands of enhancing the workforce in regional hospitals in northern Sweden, a regionalization of the medical program was initiated. The ‘germ cell’, or the qualitative new activity – relocating medical students by means of an RMP – had in one way already taken place when this thesis started in 2010. Important, however, is that the contradiction calling for a digitalization and transition to distance education, when having students distributed in different regional hospitals, was not solved. Arguably, this also raised new demands on teachers, students and management to rethink and transform their previous ways of teaching and learning in the program to fit distance education. This second part of the transformation process – making a transition from dominant face-to-face to non-dominant distance education in the medical program – is also the transition studied in this thesis.

To make it possible to analyze this process, the face-to-face and distance education activity has through theory been elaborated upon in this thesis: the face-to-face model as the dominant and historically rooted activity and the distance education activity as the future and possible qualitatively new (see Figure 5 below). It can here be noticed that the concept of dominant and non-dominant activity together with levels of learning was identified during the second part of conducting the thesis and has thereby not been included in all papers. Nevertheless, in this capstone and in Chapter 7 this will be used to further elaborate on the findings in this thesis.

The analysis of this thesis also focuses on how conflict and contradictions emerge when trying to make a transition to the non-dominant activity in the medical program (see Figure 5 below) (compare Bound, 2011). The analytical focus is moreover on how teachers, students and management, through transitional actions, are dealing with conflicts by experimenting and learning more about the new distance activity. This, in turn, is expected to make
possible different levels of learning and thereby small steps of change and future transformation in the program. Learning III will be seen as a complete transition from face-to-face to distance education. This means to put forth a qualitatively new way to conduct education at distance.

**Figure 5.** The analytical focus when studying the transition from face-to-face to distance education in the medical program.

In the next section, the research design and methodological considerations for following this process will be described.
5. Research design and methodological considerations

In this chapter, the research design and methodological considerations will be described. Research design refers to something larger than a mere description of methods used and data collection – it concerns the process of designing the project, collecting data and formulating the analytical claims and conclusions in the thesis (compare de Vaus, 2001; Kvale & Brinkmann, 2009; Silverman, 2013). Accordingly, the purpose of this chapter is to describe the research design and methodological considerations that follow from previous research, the theoretical framework of CHAT, and the particular aim and research questions of this thesis. The chapter begins with a brief description of the emerging character of the research design as a prerequisite to follow over time a rather unpredictable process of transition to distance education in the medical program. Following this, the specific methods, data collection and analytical process will be described. The chapter ends with some notes about the credibility and ethical considerations that guided this research.

The emergence of a research design

Starting in September 2010, the Faculty of Medicine at Umeå University initiated this thesis as part of a research and evaluation project. At the core of this project was to investigate the digitalization and the transition to distance education as a part of the regionalization of the medical program. For this thesis, this included the work of formulating an aim and research design that was equally important to both the medical program and the research field. Even so, the specific research questions and sub-studies to be included in the thesis were relatively open specify.

Worth noting is that as the work of the thesis started, it was not decided how the digitalization and transition to distance education would proceed in the medical program, at least not more than that it would include the introduction of a number of digital technologies and TEL solutions to support teachers and students when they were at a distance. This uncertainty influenced the planning stages of the research design. For example, the lack of clarity regarding when and how the transition was to proceed and be portrayed made it difficult to specify the foci of studies in detail and the specific time and place for data collection. A central concern in this thesis was, therefore, to set up a research design with a flexible use of methods and with sensitivity for unexpected turns and accelerating change in different parts of the medical educational practice.
The theoretical framework of CHAT, presented in the previous chapter, informs the overall methodological considerations in this thesis. How this theory defines and understands a transition from one activity to another came to be an important foundation when designing the research process in this thesis (compare de Lange, 2010; Silverman, 2013). CHAT has in addition served as a useful framework to specify the specific focus in the rather unclear process of a transition to distance education in the medical program. In applying a CHAT research design, Kaptelinin and Nardi (2006) recommend that when following a transition, the focus should be on change and transformation as a process, rather than focusing solely on the product of a transition (Kaptelinin & Nardi, 2006). In order to do so, CHAT research commonly focuses on the exploration and analysis of how activity systems unfold over time (Engeström, 1987, 2001; Kaptelinin & Nardi, 2006; Hague & Norenes, 2010). That is, to see them cycle, grow and change by means of conflicts and human (transitional) actions (Engeström, 1987, 2001; Sannino, 2008). Informed by CHAT and based on the aim and research questions, a longitudinal research design was therefore set up for this thesis with the purpose of following the process of transition over time, including the occurrence of conflicts and structural and educational transformation work done by actors throughout the process.

On a practical level, to provide a research context with empirical access to the transition and transformation work in the medical program, the primary focus came to be the first semester to make a transition to distance education in January 2011 (semester 6). The purpose of this focus was two-fold: first, to capture the process from the perspective of teachers, students and management; and second, to capture how the transformation work of these actors influenced the transition as a whole (compare the discussion of different actors in Chapter 2). As a means for following the transition, an important step was therefore to select appropriate data collection methods for the research design. As suggested by previous research based on CHAT, data on activity systems in change are preferably collected through a number of methods, including both how teachers talk and how they act (compare Kaptelinin & Nardi, 2006). Examples of data collection methods include field studies, interviewing, informal talks and collection of informative documents (see for example Foot, 2002; Rasmussen, 2005; de Lange, 2010; Jahreie, 2010). The use of such methods have in other CHAT studies enabled a rather deep and diverse understanding of change and transformation as it occurs in talk, momentary actions and long-reaching cycles in a specific context. In the following section, the different methods applied to collect data are described.
Methods and data collections

As seen in Figure 6 below, several methods were used in this thesis: surveys, field studies, logging of activity patterns and interviewing. The data were collected from September 2010 to June 2013. At the end of 2010, field studies and logging of teachers’ and students’ activity patterns on the CMS Moodle was initiated together with a number of surveys to capture early expectations pending the digitalization and transition to distance education. The data generated from these methods, was also used as a basis for the interviews, which were conducted in 2011 and later in 2012/2013.

<table>
<thead>
<tr>
<th>Data</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log data</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surveys</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 teachers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>92 students</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 administrators</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interviews</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 teachers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 students</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 management</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 teachers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 students</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 6. Overview of methods and data collections in the thesis.

The total amount of data in this thesis includes 108 completed surveys of teachers, students and administrators. Approximately 65 hours of field studies; 62 interviews with teachers, students and management; and log data of approximately 100 students’ and 100 teachers’ use of CMS were collected during 2.5 years. Below, these methods and data will be described more thoroughly.

Survey

As a starting point for this thesis, a survey was constructed. The survey was constructed in three versions suited for each group of teachers, students and administrators connected to the first regionalized semester (see Appendix 1, 2, and 3). Questions mainly concerned expectations and preparedness for the transition and how digital technologies and TEL were expected to be used to mediate the new distance activity. For example, what digital technologies and TEL solutions were expected to be implemented and used, what structural and educational transformation work did actors expect to conduct, what problems and possibilities did actors expect to face and how the education program was expected to change when the program was digitalized. In January 2011, the
survey was distributed to 100 undergraduate students, with a response rate of 92%. An online survey was sent to 16 teachers and 4 administrators, with response rates of 75% and 100%, respectively. The survey was distributed to students in a classroom setting, while an online version was sent to teachers and administrators by email, including an address to access the survey and contact information of the researcher in case of questions. Another two emails were sent as reminders to teachers and administrators who had not completed the survey.

**Field studies**
To follow the transition, including conflicts and structural and educational transformation work in the medical program, field studies were planned to proceed throughout the whole research project. As shown in Figure 6 above, field studies were conducted from 2010 to 2013. The specific method for conducting field studies was informed by previous studies conducted in the field of CHAT, using the specific method of ethnographic observations (see for example Rasmussen, 2005; de Lange, 2010; Jahreie, 2010). By being close to the practice and observing how individuals and groups talk, act and have discussions regarding transitions and transformation work, ethnographic observations had previously proved to generate data, that after being analyzed could display contradictions (compare de Lange, 2010, Engeström et al., 1997, Engeström, 1998), transitions (compare Hauge & Norenes, 2010) and change in educational practices (compare Engeström et al., 1997; de Lange & Lund, 2008).

Venues for the field studies were primarily meetings, lectures, workshops and other situations where the transition to distance education was discussed, acted upon and elaborated on by teachers, students and management. An important objective here was to observe both how these actors talked and how they acted on situations related to the transition and transformation work. For example, the focus was directed towards how teachers, students and management discussed different problems that they individually or collectively faced when trying to conduct the medical education by means of digital technologies and TEL, as well as how they were dealing with these problems in their daily practices in different ways. Another important focus was also to capture data on how actors collectively, during meetings and workshops, experimented and elaborated on new ways to conduct distance education, such as by trying and discussing new educational designs and TEL solutions for distance education in the program. Actors’ discussions were also expected to involve arguments and counterarguments to the transition and use of technology and TEL, which in turn could hint at contradictory perspectives throughout the process. In sum, these data, when analyzed, were
expected to enable the identification of conflicts, structural and educational transformation work made by actors throughout the process of transition.

During the field studies, it was also important to be able to ask follow-up questions and conduct informal interviews with actors participating in the meeting, workshop or lecture. The aim was primarily to clarify uncertainties in the collected data and to deepen the understanding of actors’ speech and actions observed during the meeting (Bogdan & Biklen, 2003, de Lange, 2010, Jahreie, 2010, Rasmussen, 2005). Such follow-up questions and informal interviews were used as a basic form of what Lincoln and Guba (1985) call respondent validation.

Another important objective when doing field studies was to provide increased insight into the specific characteristics of the educational practice in the medical program (compare Hammersley & Atkinson, 2007). For example, field notes were intended to produce deeper insight into the pre-dominant and historically rooted norms and traditions of education that were present in the medical program. This insight was mainly gathered through documents describing how the education currently and historically has been conducted (through regulations, curricula, project descriptions and action plans; see Bogdan & Biklen, 2003, de Lange, 2010, Jahreie, 2010, Rasmussen, 2005). Another example of such data is actors’ descriptions of how the program now and historically has been planned and conducted, as well as how actors’ way of planning and conducting education seems to follow or challenge these traditions by sustaining or trying new solutions to conduct education.

At the beginning of the data collection, all observations and informal interviews were recorded. However, the recording contributed to a formal setting and not natural access to the spontaneous daily practices in the program. When using pen and paper, respondents seemed to be able to discuss more freely – despite thinking about it as a part of the data collection. Consequently, the observation protocol was mainly used to type down notes at meetings and talk with respondents at the time of the observations. When returning from the field, what Silverman (2013) explains as expanded notes or memos were typed in the observation protocols. The protocols included long and detailed descriptions of what the researcher had heard and seen during the observations (Bogdan & Biklen, 2003).

**Logs of activity patterns**
Log data were collected from January 2011 to June 2013 (to June 2012 for teachers). The purpose of logging was to generate data on how teachers and students made use of different digital tools on the CMS throughout the transition, such as if, when and how often teachers and students used the CMS
forums, chat rooms and other interactive learning solutions for distance education. The log data were collected at the group level (teachers and students, respectively), by using the information in Table 2. The data were analyzed and presented in Excel files so that tables and figures of teachers’ and students’ activity patterns could be created. The analysis was aimed to generate figures and tables visualizing what digital tools were used on the CMS, how often, by how many actors and at what times during the day (compare Bruckman, 2006). This was also expected to make it possible to follow how the activity patterns changed throughout the transition.

**Table 2.** Examples of data to be included in the log data file.

<table>
<thead>
<tr>
<th>Course</th>
<th>Username</th>
<th>Date</th>
<th>Time</th>
<th>Resource</th>
<th>Action (view/add)</th>
<th>e-mail</th>
</tr>
</thead>
</table>

To gain deeper understanding of the log data analysis, the results were discussed with the respondents during the interviews. In those cases, the analyzed log data were used as a ‘mirror’ (compare Engeström et al., 1996) to display and discuss what problems seemed to occur when trying to integrate and make use of different digital tools for distance education. Moreover, it was examined how and why actors’ activity patterns appeared to change throughout the transition.

**In-depth interviews**

The interview study was conducted with teachers, students and management connected to the first regionalized semester in the program (see Figure 7 below). The semi-structured interview guides (Kvale, 2009; Kvale & Brinkmann, 2009) were informed by CHAT and in broad terms concerned problems, challenges and change related to the transition and integration of technologies and TEL (see Appendix 4, 5 and 6). For example, teachers were asked questions about how they planned and conducted their teaching (today and before the transition), what problems they faced when trying to integrate and make use of TEL and how these problems influenced their teaching practice in the program. Moreover, they were asked how they individually and together with colleagues were dealing with these problems throughout the transition. Students were asked questions about how they planned and conducted their studies (before and after the transition), what problems they faced when trying to learn through TEL and how these problems influenced their options for planning and conducting their studies. Moreover, students were asked how they individually or collectively tried to solve problems and what these solutions meant for their learning.
The interviews were conducted in two rounds with the same respondents (except those from the management, who were interviewed once on their before and after perspectives). The first round of interviews \((N = 36)\) were conducted face to face with the respondents. Each interview lasted between 45 and 90 minutes. Three of the interviews were conducted over the telephone. Teachers and management were interviewed in their offices at their respective hospitals, and students were interviewed either at my office at the department or at a location in or close to the hospital where they were doing their clinical clerkships.

During the first teacher interview, the interview guide seemed to a high degree to direct the teachers’ talk and answers. Instead of speaking freely, they spoke in a manner comparable to that of a legal hearing, giving short and formal answers. The questions and interview guide were therefore slightly reformulated to instead ask the respondents to “Tell the story about how you plan and conduct your teaching” and “Discuss the possibilities and challenges you experience in your daily work when teaching through technologies at a distance”. This new approach of asking questions appeared to be closer to in-depth interviewing, making it possible to encourage deeper and more comprehensive answers during the interviews (compare Johnson, 2001; Kvale, 2009).

The second round of interviews \((N = 25)\) was conducted with the same cohort of teachers and students after two and four semesters. The aim of the second round was to capture the transition and change in the educational practice over time. For example, responses were collected on how problems identified during the first round of interviews had occurred and changed in their appearance throughout the transition, as well as to follow up on how actors were dealing with problems by elaborating different solutions to distance education through TEL in the program. The interviews were conducted over the telephone and lasted from 20 to 50 minutes. The main reason for the telephone interviews was the teachers’ and students’ busy schedules. Telephone interviews seemed to require less time and appeared to be more flexible for the teachers and students when they were being involved in the clinic. A second reason was the geographical distribution of respondents in different hospitals in northern Sweden. Third, the telephone interviews that had been conducted during the first round of interviews turned out to be a suitable method for both the respondents and the interviewer. The respondents seemed to be able to talk more freely during the telephone interviews, and it was easier for the researcher to ask follow-up questions. To make a possible return to data and keep focused during the interviews, an audio recorder recorded all of the interviews (Peräkylä, 2005).
Selecting respondents for interviews

The selection of respondents was done differently in the different groups of teachers, students and management. When selecting teachers for interviews, the overall objective was to select teachers who were involved in the transition and the daily practice of educating professional physicians. Out of approximately 100 teachers connected to the first semester, 16 teachers were selected for interviews. Eight respondents were located at the Umeå University hospital, and six teachers were in one of the three regional hospitals (see Figure 7 below). Of those, 14 were holding a position as a teacher responsible for a specific subject.

**Figure 7.** Geographical location of interview respondents.

Selection of students for interviews was conducted through the survey distributed in January 2011. In an open request for participants, 37 students volunteered to participate in the interview study. The objective when selecting respondents was to achieve as much variation as possible among the students (compare Kvale, 2009). Out of the 37 students who volunteered, 16 were selected based on characteristics of study location, gender, self-rated computer skills and experiences, expected use of technologies etc.

The selection of management was conducted among members of the medical program committee. The six selected respondents were the dean of the
medical faculty, the head of the program committee, the head administrator, the two regionalization coordinators, and the associate professor responsible for the first regionalized semester. These respondents were predicted to be the ones most familiar with the regionalization and digitalization of the medical program and thereby the best suited for providing rich information about the transition from a management perspective.

**Analyzing and making sense of data**

To organize and analyze the large amount of qualitative data generated from both interviews and observations, the overall strategy of coding and categorizing was used in the thesis. This was done by following a broad four-step procedure inspired by Kvale and Brinkman (2009), Hjerm and Lindgren (2010). It can be noted that during the categorization, each interview round and respondent group (teacher, students and management) was analyzed separately. After being analyzed, the interview rounds were combined in order to display and understand how the transition, including conflicts and change, appeared to unfold over time in the medical program.

Subsequent to reading and listening to the data sources in order to produce an overall picture and potential patterns in the data material, the analysis proceeded in four steps. The course of this work strived for a mixture of opened-minded creativity and systematic accuracy. As a first step, to concentrate and make meaning of data, sentences, segments, descriptions and quotations were initially coded by giving them names describing their content. This was done by listening to, re-listening to, reading and re-reading respondents’ expressions and descriptions in the data. Data were given code names, such as workload, technology hassles, communication problems, technology resistance and design issues. Some codes were also given shorter descriptions targeted to help with navigation of the large number of codes.

During the second step, codes from interviews and observations were compared and in different ways related to each other. Codes that appeared to be related and concerned similar content were assembled and placed into broad categories of conflicts, transitional actions etc. Examples of conflicts included students’ difficulties making use of digital tools for their learning and teachers’ problems integrating digital tools in their current teaching practices. During this step, alternative categories, from both empirical and theoretical perspectives, were elaborated upon by moving back and forth between high and low levels of abstraction (Guba, 1978). This process resulted in a reduction of codes into broad categories of coded text, sentences and extracts. This process was conducted a number of times until what Kvale and Brinkman (2009) call saturation was considered to have been reached—in short, when it did not seem to be possible to find any more themes based on the data.
In the third step, CHAT was used more thoroughly to produce meaning and a higher level of abstraction in the categories of codes. For example, in Papers 3 and 4, the theoretical concepts of conflicts and contradictions were used to deepen the analysis of categories. This was done for example by analyzing the roots of conflicts and how these seemed to complicate teachers’ and students’ attempts to integrate and make use of digital technologies and TEL for distance education. A similar analysis was done by using the theoretical concept of ‘transitional actions’ in Papers 3 and 4. This concept was used to deepen the interpretation of teachers’ and students’ attempts to solve conflicts and how these attempts appeared to present new possibilities for structural and educational change in the program. During this third step, the combination of interview and observation data proved to be especially important to deepen the analysis. Codes and categories that were difficult to interpret during this step were for example helped by combining data from interviews and observations. A presumed double-bind situation in Paper 4 could serve as an example. Observational data from a meeting including students and the management of the medical program made it clear that students were disappointment with some TEL solutions. The observation data were insufficient for understanding the underlying conflict disturbing the students, however. Here, interview data proved important to generate a more extensive analysis that gave a sufficient base in order to identify and analyze the actual root of the conflict.

Finally, together, the analyses from the different interview rounds and time phases of the project were used to provide an overview of the medical program’s long-term transition to distance education. An analysis was also made on an aggregated level with the purpose to display how conflicts and transitional actions over time occurred and had an influence both within and between the different actors of teachers, students and management in the program. During this final step, CHAT as an overarching theoretical framework was also brought to bear in order to gain a deeper understanding of how the interplay between different categories of conflicts and transitional actions, for example, could be understood with reference to important structural and educational changes in the program throughout the transition.

**Ethical considerations**
The Regional Ethical Review Board, Umeå University, Sweden, approved this research project in 2010 (with approval number 2010-304-31Ö). The research project was informed by the recommendations of the Swedish Research Council (2015). This means that ethical research standards and guidelines were considered throughout the research process. Respondents were informed about the aim of the project, methods and how data would be used and presented in the project. To ensure that all respondents would get relevant
and correct information, respondents were informed during lectures and meetings. Students were also through a written letter (Appendix 7) on the CMS. The letter included instructions on how respondents could disclaim their participation in the log data analysis on the CMS. Respondents’ option to withdraw their participation in interviews was further articulated before and in direct relation to each interview (Silverman, 2013).

When transcribing interviews, respondents were anonymized by given names as 1, 2, 3 and so forth (Silverman, 2013). The selection of quotations was carefully considered so that respondents would not be revealed by their vocabulary. This was particularly important in the management study because there were rather few respondents, and the name of the university was exposed. Knowledge of respondents’ vocabularies was gained during observations in order not to expose them by use of typical expressions and such. Other ethical aspects relate to the distinction between private and personal conversations during observations. The focus during the observations was on work-related discussions rather than private conversations between respondents. Finally, all data collected in this thesis have been kept locked up and inaccessible to unauthorized individuals.

**Credibility and transferability**

In this section, the credibility and transferability of this research project will be discussed. Credibility in research refers to the capability of producing trustworthy descriptions based on reliable research methods and correctness in findings and analytical claims (Silverman, 2013). The degree of credibility is often discussed in terms of representativeness in empirical data, whether other researchers would discover the same results, whether empirical data can support answering the research questions and whether the researcher has interpreted the empirical data in a convincing way (Silverman, 2013). In this section, it will be discussed how the researcher has strived to strengthen the credibility and transferability of this thesis.

Silverman (2013) claims that showing as much as possible of the research procedure can make it possible for other researchers to determine the credibility of the research (see also Lindberg & Olofsson, 2005). This has been the intention when writing both the capstone and the papers in this thesis. By outlining the different steps in this research process, the purpose is to make it possible for other readers to reflect on and discuss the transparency, methodological awareness, methodological rigor and logical argumentation behind the thesis.

Another way to strengthen the trustworthiness of this thesis has been to validate data with the respondents (Lincoln & Guba, 1985). To do this,
empirical data and analytical claims were on a regular basis presented to and discussed with teachers, students and management during seminars, teacher meetings and the yearly ‘program day’ in the medical program. This made it possible for the respondents to discuss and make suggestions on data and early analytical claims produced in this thesis.

A second way of further strengthening credibility is to make it possible for other researchers to determine the transparency, trustworthiness and logical argumentation of the research (Silverman, 2013). This in particular was done by making available quotations in each paper of this thesis (Silverman, 2013). There was also collaboration with other researchers and co-authors during the research process (compare Rasmussen, 2005). For example, data, methods and analytical claims were regularly presented to and discussed with the supervisors, senior colleagues, PhD students and co-authors of papers. All papers have in addition been peer-reviewed by professional and qualified researchers.

A third way to strengthen the credibility and trustworthiness of the study was the use and combination of different methods and data in this thesis. Combining data from observations and interviews, for example, made it possible to both validate and deepen the analytical claims in this thesis (Silverman, 2013). It should though be noted that the purpose of combining different forms of data has not been to find an objective truth (see further discussions on knowledge claims in sociocultural research in for example Shweder, 1995), but rather to search for a deeper understanding of the transition to distance education in the medical program in focus. The combination of data have in addition made it possible to validate, compare and discuss short-term data with data collected on a long-term basis. Occurrences that appeared during the first stage of the transition could thereby be followed, discussed and more deeply understood from a longitudinal perspective.

Before ending this chapter, the transferability in findings and analytical claims in this thesis will now be discussed. Transferability, as Kvale and Brinkmann (2009) define it, refers to the “extent that findings in one situation can be transferred to other situations” (p. 324). According to Lincoln and Guba (1999), the pursuit of such transferability must rest on the researcher’s rich descriptions of the specific context in which a situation or an occurrence is studied. That is, it must allow for other researchers and practitioners, by reflecting upon the similarity of contexts, to decide how insights and analytical claims could be useful to inform situations other than the one studied. This thesis is an attempt to provide other researchers and practitioners with such an opportunity. One attempt in doing so is to present a rich and detailed
description of the wider empirical context in which digitalization and the transition is taking place. The aim of Chapter 3, for example, is to produce a useful avenue for understanding the medical education context in which the transition is taking place so that researchers and practitioners can value the differences and significance of contextual features when using the results and findings presented in this thesis.

Another attempt is to lay out a ground for comparing the findings in this thesis to those of other studies produced in the field. The purpose of Chapter 2 was to present a foundation on which findings in this thesis can be discussed and compared. The pursuit of comparative discussions is also to display what findings and analytical claims are relevant to the field of medical education as well as other, similar contexts and situations that possess similar characteristics. Put differently, it is to make the findings more generally relevant to different researchers in the field.

Kvale (1996) further discussed transferability in terms of how “findings from one study can be used as a guide to what might occur in another situation” (p. 233). Arguably, this thesis may be relevant for guiding researchers and practitioners involved in digitalization and transitions both inside and outside medical education. For example, the framework of viewing and conducting a transition in smaller steps, as has been done in this thesis, can probably be transferred to a variety of other situations and contexts. This also includes considering the influence of previously established tools and traditions when making a transition, as discussed in Chapters 3 and 4 above. Again, the relevance of findings and analytical claims to guide other similar projects depends though on how researchers and practitioners value its significance for the specific situation (Kvale, 1996).

The four papers produced in this thesis will be summarized in the next section. The findings of these papers are thereafter discussed in Chapter 7.
6. Extended summaries of papers

This chapter comprises extended summaries of the papers included in this thesis. In specific, the summaries include each paper’s aim, methods used, findings and concluding remarks. A discussion concerning the summaries and their relation to the aim and overarching research questions in this thesis appears in Chapter 7.

Paper 1

The aim of this paper was to explore teachers’ and administrative staffs’ expectations and preparedness when making a transition to distance education. The main empirical data are derived from an online survey distributed in December 2010. The survey was distributed to four administrators and 16 teachers working the first semester of the medical program to be regionalized and make a transition. Four administrators and 12 teachers completed the survey.

One analytical claim in this paper is that despite teachers’ limited experience of distance education, they expressed preparedness for making a transition to distance education in the medical program. One important finding related to this claim is that the teachers did not seem to expect the digitalization and transition from face-to-face to distance education to include, or require, any larger educational changes in the educational practice. The findings in this paper indicate for example that the use of content-based teaching and an increase in the number of streamed lectures in particular were what teachers expected to use and were prepared for. Accordingly, this also supports the idea that teachers primarily expected the transition to replicate the existing teaching activity by means of digital technologies as new mediating tools. One reason for this, as discussed in this paper, is medical programs strong tradition of content-based teaching, which appears to remain the same despite transitions to distance education. Moreover, that such transitions in themselves might not constitute any major changes in the educational practice.
Paper 2

This paper was guided by two research questions: how do executives understand and experience the implementation process of digital technologies and conditions for TEL in the medical program, and what possibilities and challenges can be uncovered and further discussed in relation to the future improvement of the educational practice in the medical program. The paper builds on six interviews with executives and 50 hours of observed meetings between September 2010 and May 2011. In this paper, focus was shifted from expectations and preparation work towards the experiences of the actual digitalization and transition to distance education in the medical program. The theoretical concept of contradiction (Engeström, 1987) was used to explicate challenges but also possibilities for structural and educational changes in the educational practice of the program throughout the transition.

The analysis of observations and interviews displays a number of conflicts that influenced and regulated the transition to the new distance education activity in the program. The analysis reveals, for example, how management and teachers were oriented towards different objects and motives during the transition. While the management appeared to focus on educational transformation work, the teachers placed a focus on sustaining existing teaching routines already established in the program. These different orientations also seemed to create a conflict that constrained the formation of, and transition to, distance education.

The analysis in this paper further displays how the transition revealed a number of conflicts that had existed covertly in the program, including lack of constructive alignment, obsolete course content, overlaps between courses and ad hoc teaching solutions without an academic rationale. Those conflicts, in turn, appeared to force both management and teachers into structural and educational transformation work that was not expected when planning for the transition. This resulted in important changes in terms of increased quality of the educational content and changes to the way in which the program was organized, structured and delivered to students.

One conclusion that can be drawn from this paper is that the transition drove a large number of structural and educational changes not expected when planning for the transition. Another is that making a transition to distance education in a program characterized by strong teaching traditions is not an
easy and straightforward task. Even though a transition can drive structural and educational transformation work, it appears to be an exhausting process for the actors. A third conclusion is that solving unexpected conflicts and planning for structural and educational transformation work might call for time, effort and competencies that are outside the ordinary work of educating professional physicians.

**Paper 3**


This paper explored how teachers were trying to integrate and make use of digital technologies for distance education. In particular, it examined possibilities and challenges when implementing distance teaching for theoretical content in the medical program. The paper draws on data collected from December 2010 to June 2012. The data builds on 26 interviews, an online survey completed by 12 (of 16) teachers and log data covering approximately 100 teachers’ patterns of activity on the CMS from January 2011 to June 2012. Moreover, it included a total of 32 hours of observation of teacher meeting, workshops, lectures etc.

This paper argues that the framework of CHAT and the concepts of dominant and non-dominant activities can serve as useful tools to deepen the understanding of making the transition from dominant face-to-face activity to a new non-dominant distance education activity in medical education. The theoretical concepts applied in the analysis were Engeström’s (1987) concepts of conflicts and contradictions and Sannino’s concept of transitional actions. Conflicts and contradictions were mainly used to display conflicts that hinder teachers from making a transition to distance education, while transitional actions were applied to describe how teachers found ways to overcome conflicts throughout the process by conducting structural and educational transformation work in their teaching activities.

The analysis displays how a historically rooted face-to-face activity from the past regulated the transition to distance education in the program. For example, an analysis of observed and expressed problems revealed several conflicts that appeared to inhibit teachers to put forth the transition and to make use of digital technologies. By illustrating transitional actions as small, innovative bottom-up solutions of structural and educational transformation work in the face-to-face teaching activity, further analysis revealed how teachers tried to overcome conflicts and to carry out a transition to the
distance activity. That is for example by experimenting on new educational designs and ways of organizing the education when being at a distance.

In the discussion, it is argued that educational activities from the past are an unavoidable part of a programs context and will be there as influencing and regulating forces during the transition to new and unproven activities. Thus, it is in this paper suggested that a transition to distance education in medical education should be explored and analyzed as an interplay between dominant old and non-dominant activities.

This paper concluded that supporting teachers’ transitional actions can be of great importance in order to put forth structural and educational transformation work and thereby facilitate a transition to distance education. One example is to encourage teachers to be creative and to find their own solutions to teaching-related conflicts. Further, such creative ways of dealing with conflicts during the transition can lead to a systematic and sustainable transition from the historically dominant face-to-face activity to distance education as a qualitative new education activity in the program.

**Paper 4**


This paper examined medical students’ experiences of trying to make a transition from face-to-face to distance learners in the medical program in Sweden. One group of students was followed for six semesters through surveys, log data, observations and in-depth interviews. The empirical data derive from an online survey completed by 92 (of 100) medical students, a total of 31 hours of observations, 29 interviews and log data covering approximately 100 medical students’ patterns of activity on the CMS. A research model built on CHAT, including the concepts of dominant and non-dominant activities, conflicts and transitional actions, was put into work in order to identify factors that influence students’ gradual transition to distance learners.

The analysis in this paper revealed possibilities but also challenges in terms of historically grounded conflicts that inhibited medical students from making a complete transition to distance learners. For example, the analysis displays how students tried to become flexible and self-reliant distance learners through the use of distance learning resources. At the same time, they faced conflicts that inhibited them from taking advantage of those possibilities when
they were at a distance. By uncovering inhibiting conflicts, these problems appeared to be due to teachers’ attempts to hold onto old teaching methods created for face-to-face education. This, in turn, complicated students’ learning at a distance and made them insecure regarding whether they would be able to develop enough adequate knowledge to meet the learning goals in the program through distance learning.

The analysis in this paper further revealed a culminating need for structural and educational transformation work in the program in order to facilitate students’ transition to distance learners. Specifically, there was a need for the program to move away from the face-to-face learning as the predominant guiding principle for education towards new education activity adopted for distance learning. Interestingly, however, the analysis reveals how after five semesters of efforts to make the transition, several conflicts had been completely or partly resolved by teachers, students or management of the program. Students’ eagerness to overcome conflicts had resulted in a number of transitional actions in the educational practice, for example, which also facilitated their transition to distance learners. This included examples of small, innovative hybrids, such as students’ new, innovative ways to learn at a distance, teachers’ new educational designs adapted for distance education, and teachers’ and management’s attempts to permit constructive alignment and digital tools integrated in the schedules. Such transitional actions, which also forced teachers and management to engage in structural and educational transformation work, appeared to have had the power to assist in slowly changing the dominant face-to-face activity into a new education activity adapted for distance education. That is, as expressed by Sannino, they allowed “changing the dominant activity from inside in small steps” (p. 337) to better suit distance learning.
7. Analysis and discussion

The overall aim of this thesis is to describe, analyze and understand structural and educational transformation work in medical education when making a transition from face-to-face to distance education by means of digital technologies and TEL. Drawing on CHAT, the aim is to explore the interplay between conflicts and changes as it occurred over time for teachers, students and management in the regionalized medical program in Sweden. Based on the theoretical framework of CHAT, this final chapter will discuss and elaborate on the main findings in this thesis. In addition to the theoretical concepts used in the papers of this thesis, this chapter will put at work the concept of levels of learning introduced by Bateson (1972) and developed by Engeström (1987; see Chapter 4) in an attempt to deepen the analysis and description of the thesis’s results. For example, conceptualizing the transition and transformational work as proceeding through smaller steps of learning will make it possible to analyze and describe an ongoing and gradual transition, even though it did not end up with a complete transformation in the educational practice of the medical program. In doing this, the chapter will start by discussing the two research questions presented in Chapter 1. Following this, the overall aim, including the structural and educational changes in the medical program will be discussed. The chapter ends with some reflections on contributions to practice, suggestions for future research and concluding remarks.

RQ 1. Expectations and the influence of previous traditions

This research question was first treated in Paper 1 and concerns teachers’ and students’ expectations pending the transition to distance education. One insight revealed in Paper 1 is that the transition from face-to-face to distance education was not expected by teachers to include or require any larger structural and educational changes in the educational practice. Rather, teachers seemed to expect the use of technologies to replicate or supplement existing practices in the program (compare Beetham & Sharpe, 2007; Blin & Munro, 2008; Kirkwood, 2009; Kirkwood & Price, 2014; Lewis et al., 2014). Arguably, these expectations reinforce the idea that distance education and TEL can entail a continuation of an existing educational practice, but with support of digital technologies as new mediating tools (see Kirkwood & Price, 2014). This also shows the various faces of TEL.

Another insight related to this research question, revealed in Paper 1 and 3, is that teachers mainly expected to use technologies for supporting content-oriented teaching such as live-send and streamed lectures, uploading learning materials, instructions etc. Such technology use is also reflected in
international research concerned with this topic (Ellaway, 2011; Mason et al., 2014). The findings of this thesis indicate that expectations of the scarce use of cases, seminars etc., characterized by process-based teaching, might be due to the limited knowledge and experience communicating with students when at a distance. This in turn requires teachers to conduct educational changes such as development of new educational designs to facilitate online interaction. Accordingly, this also indicates that content-based teaching is expected to be less demanding for the teachers to implement and use when being at a distance.

The teacher expectations raise certain questions and concerns, including why such expectations appear to be central and whether expectations of non-educational change can actually remain throughout a transition to a distance activity in medical education. To deepen the analysis of teachers’ and students’ expectations, and at the same time answer previous calls for theoretically driven research designs in medical education research (see for example Cook, Garside & Levinson, 2010), Sannino’s notion of dominant and non-dominant activities was introduced in Papers 3 and 4. As argued by Sannino (2008), important when introducing new tools and ideas for education is to consider the occurrence of already existing educational activities in the program context. Thus, by placing an analytical focus on dominating activities, research can avail an account of how existing activities might regulate and dominate the introduction of new educational tools and activities within a program context. Based on the interpretations of findings in this thesis, it seems possible to argue that initial expectations pending the transition are influenced by an already existing education activity including dominating norms and routines for how medical students could and should be taught to become professional physicians. Chapter 3, for example, describes how several medical programs, including the medical program in Umeå, historically have emerged as deep-rooted cultures that to a large extent have preferred certain tools and methods for teaching and learning (Cooke, Irby & O’Brien, 2010; Mohamed, 2010). Traditional content-based teaching by communicating knowledge in the classroom is one characteristic example that has historically emerged to entail a rather stable and enduring tradition that steers theoretical education in the medical program and its courses (compare Cooke, Irby & O’Brien, 2010; Mohamed, 2010). This tradition of arranging education seems also to be the case for the medical program that was the focus of this thesis (see for example Paper 2, in which the management refers to a strong tradition of teaching medical students through classroom-based lectures). This also reinforces the idea that when implementing something new, there will be something there from before that is perceived to be safe and comfortable for actors to stay in or return to (Sannino, 2008).
At the epicenter of this interpretation, as discussed in Papers 3 and 4, is that distance education is implemented not in an empty space, but rather within and in relation to already established educational practices and ideas. Arguably, this also means that a transition to a new distance education activity takes place in a program context, occupied by other, previously taken for granted tools and activities developed for campus-based education. This also means that the new distance activity might have to compete with already established ideas and traditions in order to be integrated into the program context (compare Hauge, 2014). It seems possible also to argue that teachers’ expectations and actions are influenced and built on previous experiences and practices of education that also are close at hand when planning for educating professional physicians. For example, Lund and Rasmussen (2008) put forth that “tasks are cultural and social constructions and there are certain cultural conventions of approaching and solving tasks” (p. 409). Moreover, as argued by Sannino (2008), previous traditions that steer teachers’ expectations and practices in turn put new non-dominant activities at risk of being hindered from being further implemented in the program context. Not least, as the results in this thesis indicate, it is expected among teachers that it is comfortable and less time-consuming to sustain what already exists.

The influence of already existing and dominating tools and activities in the medical program was also evident in Papers 2, 3 and 4. For example, several teachers expressed expectations and worries that the so-called traditional teaching that historically had made sense for learning about medicine would be outcompeted out by new and unproven digital tools and distance learning solutions in the program (see Paper 3). Worries seemed for example to be that digital technologies would not make it possible to mediate the same learning experiences, as the established dominant face-to-face alternatives in the program could do. Put differently, students would face problems in reaching the object of becoming a professional physician when being educated through TEL. Implementing new tools and developing new designs for distance education were also expected by teachers to require more time and effort than sustaining the ordinary dittos developed for face-to-face education. Consequently, this seemed to mean that teachers both expected and attempted to hold back the transition to the new and unproven tools and methods for distance education. This also displays the consequences of teachers’ expectations and practices when new educational tools and activities are compared to and negotiated against what already exists in the program.

The way of analytically viewing the transition – from a dominant face-to-face activity to a new and unproven non-dominant activity – proved to contribute to deeper understanding of the process of digitalizing medical education (see Papers 3 and 4), not least when it came to discussing expectations pending the
transition in medical education. As is apparent in this thesis, a transition from a stable and established tradition of education towards something new and unknown, as was the case in this program, requires teachers, students and management to leave their previous comfort zones and enter something new and unproven. In those cases, the management of program and its courses needed to captivate teachers and students with the benefits of the new and lead them to rethink their previous expectations of what distance education could and should be (compare Hauge, 2014).

The next section includes a discussion about how the transition from the dominant face-to-face to the non-dominant distance activity over time forced conflicts but also structural and educational changes in the medical program.

**RQ 2 Conflicts and changes during a transition**

The second research question is about how conflicts and change occur over time and how teachers, students and management are dealing with these as part of the transition to distance education. In this section, the concept of levels of learning will be used to allow analysis and description of a gradual and ongoing transition in the program even though it has not resulted in a complete transformation of the educational practice. This should also be read as a possibility to analytically go deeper into the transition and how the educational practice unfolds as teachers, students and management deal with conflicts and structural and educational changes throughout the transition. This process, starting with the preceding contradiction in the medical program will be discussed below.

The traditional campus-based program along with students who were distributed in different regional hospitals in northern Sweden was the contradiction, which forced the development of distance education. This geographic distribution of students made it impossible to continue the traditional campus education and called for new educational solutions to conduct the program at a distance. Interpretation work connected to findings in this thesis from a theoretical point of view displays that a first attempt to solve this contradiction was to digitalize the program and find new educational tools by establishing a situation of Learning IIa in the program (see Table 3 and Figure 8 below). As described in the previous section, this was primarily to find and implement new tools that could mediate and replicate the established educational practice in the program, which is common also in other program and courses worldwide (compare Beetham & Shapre, 2007; Blin & Munro, 2008; Kirkwood, 2009; Kirkwood & Price, 2014; Lewis et al., 2014).
Table 3. Before the first semester of the transition – examples of conflicts, transitional actions and levels of learning.

<table>
<thead>
<tr>
<th>Conflict:</th>
<th>Transitional actions:</th>
<th>Primary level of learning: Learning IIa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impossibility of continuing the campus education when teachers and students are distributed in different hospitals</td>
<td>Experimenting and learning new mediating tools to enable education between locations</td>
<td>Experimenting and finding new tools to make possible and sustain the education at a distance</td>
</tr>
<tr>
<td></td>
<td>Support from educational technologists</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Professional development in new tools</td>
<td></td>
</tr>
</tbody>
</table>

Figure 8. Levels of learning throughout the transition in the medical program.

If using the illustration in Figure 8 above, the interpreted level of Learning IIa present in the program during the first semester can on the one hand be seen as an effective solution of a transition that easily creates a possibility to continue the current medical education practice at a distance. Indeed, this might be a possible solution in certain programs and courses. However, several researchers claim that replicating a practice by means of new tools without making structural and educational changes often creates
unsatisfactory experiences for both teachers and students when they are at a
distance (Kirkwood & Price, 2014). This was also evident in this thesis.

Through a close exploration of the process of Learning IIa in the medical
program, several conflicts were displayed that disturbed teachers and
students when they were trying to teach and learn at a distance (see examples
of conflicts in Table 4 below). Several conflicts surfaced in that a large number
of students during the first semester expressed worries regarding whether
they would sufficiently reach the learning goals when they were part of the
distance education format developed in the program (compare Bound, 2011;
Kirkwood & Price, 2014). One example appeared during a distance seminar
conducted by means of educational designs made for traditional face-to-face
classroom seminars (see Papers 3 and 4). This ended up in a double-bind
situation for some students, who raised voices of concern about whether they
would develop enough knowledge for passing the exam by means of distance
seminars (see further description of the double bind in Paper 4). Other
examples noted in Paper 4 were students pointing at insufficient instructions
in how to use the digital learning materials and conduct tasks for reaching the
learning goals of the course. Moreover, the methods of using the forums, chat
rooms and other interactive tools in the CMS failed to mediate the interaction
needed for students’ learning. Consequently, students spent a large amount of
time on task and tool orientation during the course ending up in resistance to
certain tools and learning elements. Similar arguments can for example be
found in Lund and Rasmussen (2008). They point out that “If available tools
do not facilitate the disentangling of the problem at hand it is simply not
relevant for participants to pick them up.” (p. 388). Put differently, if students’
learning are to be facilitated, the tools and activity might have to contain
elements of technological and pedagogical co-redesign.

This disturbed workflow continued during the first and second semesters of
the transition. However, as displayed in Papers 2, 3 and 4, these conflicts and
double binds successively appeared to instigate teachers, students and
management to shift the focus from replicating existing practices to making
educational changes for TEL and distance education. This change in focus also
proved to bring teachers, students and management to a more complex level
of Learning IIb in the medical program (see Figure 8 above), which was
characterized by experimenting and finding new methods and designs for
conducting education at a distance. Importantly, as shown in the analysis,
three and four semesters of experimenting and learning more about how to
organize and conduct distance education brought about new educational
designs and procedures, which could better support students’ distance
learning (see examples of transitional actions in Paper 3 and Table 4). For
example, as displayed in Paper 3, teachers developed new strategies for
conducting distance seminars (see Paper 3), new instructions for using digital learning materials, better constructive alignment in courses and TEL solutions and updated learning materials on the CMS (see Papers 2, 3 and 4 for further descriptions of structural and educational changes). Students in the medical program developed new innovative solutions for using the digital learning materials that in new and more flexible ways could help them to combine theoretical studies with clinical clerkship (see Paper 4). Moreover, together with teachers, students experimented on new designs that could support different types of seminars when they were at a distance.

Table 4. The first and second semester of the transition – examples of conflicts, transitional actions and levels of learning.

<table>
<thead>
<tr>
<th>Conflicts:</th>
<th>Transitional actions:</th>
<th>Primary level of learning: Learning IIb</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teachers:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insufficient educational designs for distance teaching</td>
<td>Using the CMS to learn from colleagues</td>
<td>New educational designs</td>
</tr>
<tr>
<td>Competition between old and new tools</td>
<td>Experimenting with educational designs with support from education technologists</td>
<td>New use and new instructions for using digital materials</td>
</tr>
<tr>
<td>Challenges related to time and competencies</td>
<td>Using the CMS to learn more about distance teaching</td>
<td></td>
</tr>
<tr>
<td>Limited trust in digital tools</td>
<td>Experimenting with new educational designs</td>
<td></td>
</tr>
<tr>
<td>Overlaps and obsolete course content</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Students:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limited trust in distance learning and digital tools</td>
<td>Discussing on new solutions with teachers and management</td>
<td>New flexible and innovative ways of organizing learning at a distance</td>
</tr>
<tr>
<td>Insufficient instructions in how to use online learning materials</td>
<td>Learning more about flexible ways to learn at a distance</td>
<td>New solutions for repetition, additional material and varying learning styles</td>
</tr>
<tr>
<td>Insufficient educational designs</td>
<td>Learning how to use learning materials to reach different course objectives</td>
<td></td>
</tr>
<tr>
<td>Regulating and inhibiting rules produced by the management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of participation on the CMS</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Management:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaustion from program organization</td>
<td>Balancing the enhanced workload</td>
<td>New ideas and designs for enhancing the quality of the program</td>
</tr>
<tr>
<td>Conflicting motives in the program community</td>
<td>Motivating teachers to move further into the transition</td>
<td></td>
</tr>
</tbody>
</table>
Table 4 shows how teachers and students dealt with conflicts as a part of the transition during the five semesters. The longitudinal perspective used to capture the process shows how the implementation of new tools to replicate and continue an existing practice creates new conflicts and double binds that over time force teachers and students into educational transformation work in the program. That is, the experimented with new educational design solutions and ways of organizing education, which could be seen to end up in the level of Learning IIb. On the one hand, as revealed in this chapter, conflicts when being solved create important possibilities for structural and educational changes that also seem to support students in making their own transitions from face-to-face to distance learners (see Paper 4). New TEL solutions, for example, seemed to make students more comfortable in using digital learning materials and organizing their learning in new, innovative and flexible ways at a distance. On the other hand, as shown in Papers 2, 3 and 4, conflicts appeared to create substantial challenges for teachers, students and management in their efforts to carry out digitalization and the transition to distance education. For example, learning to use new digital tools and making educational changes required time, effort and competencies that appeared to be outside the ordinary daily work of educating medical students. In a sense, medical teachers – who are often trained as medical professionals, not primarily as educators with knowledge of technical and educational design issues – seemed to be forced to move beyond their previous knowledge and expertise when trying to solve conflicts as a part of Learning IIb (compare Alur, Fatima & Joseph, 2002; McQuiggan, 2007; Gregory & Lodge, 2015). Indeed, entering the level of Learning IIb seems according to Bates (1972) to be a demanding process, especially for those teachers who are not prepared for any major educational changes.

Structural and educational change put heavy demands on program management (compare Keppell et al., 2010; Yadgir, 2011; Markova, 2014). This thesis, for example, shows that management holds an important position not only in supporting teachers in making necessary changes but also in balancing the increased and diverse workload generated by the transition (Nworie, Haughton & Oprandi, 2012). As argued by Gregory and Lodge (2015) regarding digitalizing educational programs, inexperienced management can make it difficult to predict upcoming conflicts and speculate on the structural and educational transformation work needed to make TEL possible and bring about a transition to distance education. This thesis, as previously discussed by Gregory and Lodge (2015), also shows that demands for educational change
often occur as hidden conflicts that are neither expected nor accounted for when planning for digitalization (see Paper 2).

Another point in this discussion is that teachers, students and management appear to be dependent on each other when solving conflicts and making changes in the program. The interpretative work connected to Paper 4 indicates how students’ attempts at solving conflicts related to the transition to distance learners are constantly influenced by other nearby systems, such as those of teachers and management. For example, during an early stage of the transition, medical students did not seem to fully trust the new distance learning activity and digital tools to mediate their learning when trying to become professional physicians. They seemed to be waiting for the teachers to make a complete transition from face-to-face to distance teachers, by making the necessary changes in educational practice. In addition, for management to ensure sustained quality in the program throughout the transition, they appears to be dependent on the teachers to make the necessary changes in teaching practice. As claimed in previous research, this proves the importance of the interplay between actors in developing reliable and trustworthy learning environments and TEL solutions so that students can be comfortable developing new tools and strategies for reaching their learning objectives (Kirkwood & Price, 2014; Moore & Kearsley, 2012; Liu & Wu, 2010). Such interplay would for example be a joint development in the community of teachers, students and management; the distance education system collectively needs to develop and transform to facilitate students’ distance learning (Moore & Kearsley, 2012).

In this section, it also becomes apparent that a longitudinal perspective is rewarding when studying digitalization and the transition from face-to-face to distance learning in medical education. For example, during a process that lasted two and a half years, it was possible to display how conflicts occur and how they change in appearance throughout a transition. It was also possible to display the transformation work as the transition changed in focus from implementing new digital tools to develop new educational designs for program and courses. Moreover, as discussed above, implementing new digital tools seems not enough to sufficiently conduct education at a distance; structural and educational transformation work must always be present in the transition from face-to-face to distance education (compare Kirkwood & Price, 2014). Digital technologies, as new mediating tools, play an important role as the catalyst of the transformational process. Digital technologies, more than being new mediating tools, invoke a new logic of education that can challenge old traditions and force actors to rethink and transform previously established practices. This also indicates how new mediating tools can possess the power
to drive qualitative transformation through new and innovative TEL solutions for program and courses.

The next section will discuss the main structural and educational changes that digitalization has brought to medical education practice.

**Structural and educational changes during a transition**

Due to the longitudinal research design used in this thesis, it has been possible to follow how changes have emerged in different parts of the program. Taking into account a combined analysis of Papers 2, 3 and 4, including the perspectives of teachers, students and management, shows that digitalization and transition drive a large number of structural and educational changes. These changes are perhaps unexpected when planning for the transition in the medical program. One such example is the unexpected move from a rather closed classroom to an open and transparent learning environment. As shown in Paper 2, uploading learning materials to the CMS as a part of the digitalization increased insight into a previously rather complex and content-heavy program structure. The increased insight, in turn, revealed a number of hidden conflicts that have existed in the medical program. These hidden conflicts include a lack of constructive alignment, obsolete course content and overlaps between courses. Consequently, the revelation of such conflicts appears to have forced the program into structural and educational changes driven by, but partially located outside, the core of the digitalization and transition. A critical remark in this respect is that the digitization was expected to comprise mainly the implementation of new technologies. These technologies, in itself, would not contribute to any larger structural or educational changes in the program. Despite this, more changes occurred than were expected. The findings in this thesis indicate how distance education and digital technologies have the power to challenge historically rooted traditions and practices for educating professional physicians (compare Clarke-Midura & Dede, 2010). This was also shown to have an impact on the quality of education, both in content and in execution. These changes included increased quality in the educational content and improved ways for the content to be organized, designed and delivered to students.

Another interesting finding relates to the increased coordination and openness within and between courses in the medical program. Not least in importance was the historical occurrence of medical programs worldwide, as presented in Chapter 3. Insights from Cooke, Irby and O’Brien (2010) show how medical programs historically have been characterized by discipline-based curriculum designs, with a rather limited coordination between subjects and courses. This has also been said about the medical program at Umeå University (compare Naredi et al., 2012). However, this thesis reveals that
digitalization is an important catalyst for increasing such coordination and communication. For example, the interplay between conflicts and changes in the program means that a discussion about structural and educational issues has emerged within and between different subjects and semesters in the program. The CMS, as a shared learning space, has for example brought courses and semesters together and supported them in finding local solutions to shared conflicts. Put differently, the CMS has helped teachers to learn more about distance education and TEL while having access to colleagues’ innovative solutions online. This again pinpoints the importance of increased openness in the program.

Another point in this discussion is that the transition, from the beginning, was expected to involve the use of new digital tools to replicate existing practices during five semesters. These tools have stimulated new educational designs in the program. Moreover, the digitalization that was intended to include only clinical semesters in the program have also proved to influence also the early pre-clinical semesters. This also reveals the benefits driven by the transition from face-to-face to distance education. For example, the medical program that previously was characterized by rather strict boundaries between courses and subjects now has, through distance education, allowed students to freely access all learning materials, even between semesters. Consequently, students in different courses have experienced new possibilities for learning through TEL, using digital technologies to facilitate preparation for forthcoming semesters, repetition of failed exams, use of learning materials to fit a specific clinical practice, and possibilities for different learning styles. According to Paper 4, this has made the medical program somewhat more flexible and modern.

Even if digitalization and the transition to distance education has brought important structural and educational changes in the medical program, this thesis also displays the effort and hard work behind such a process. As revealed in Paper 2, the management talk about digitalization and transition as being both rewarding and exhausting for the program and actors involved. This means, as also seen in Paper 2, that solving conflicts through structural and educational changes have to be balanced alongside the ordinary daily work of educating professional physicians. This has also led to a complex web of challenges for the management to navigate the transformation work, to support and guide actors in the program community, and to make important decisions that can influence many aspects of education in the program (compare Miller et al., 2014; Benke et al., 2014; Chaloux & Miller, 2014). A possibility to support a future transition in medical education would therefore be to develop an institutional strategy for collectively planning for and dealing with conflicts and changes throughout the transition (Gregory & Lodge, 2015).
That would require a focus on how to best utilize the benefits of a digitalization and how to best undertake the necessary structural and educational transformation work to bring about a transition from face-to-face to distance education.

**Notes on contribution to practice**
This section aims to summarize the overall contribution this thesis can make to practice. Teachers and management might benefit from this thesis at least in three ways. First, an important aspect when making transitions is to take into account the influence of the existing teaching traditions, including predominant norms, values and routines. As the transition to distance education by means of new digital tools often forces teachers, students and management to rethink their previous educational practices, it might be tempting for them to stay in the comfortable old. Second, findings in this thesis display how existing practices do not always benefit from new tools and vice-versa. By initiating experimentation and educational discussion, the use of existing practices can be replaced with other, more suitable, ways of organizing and designing education at a distance. Third, experimental transitional actions (as a part of Learning IIb) can imply significant bottom-up initiatives that cultivate changes in a program and its courses over time. To acknowledge and continuously support these transitional actions made by teachers seems therefore to be of great importance. To support local solutions among teachers could, for example, mean encouraging them to be creative and to find their own local solutions to teaching-related issues instead of consuming ready-made dittos (compare Lindberg & Olofsson, 2012). From a management perspective, this could also mean being sensitive to the history and traditions already inherent in a program. This history might indicate the need to reformulate previous ideas about education in the program (Kreber & Kanuka, 2006; Kirkwood, 2009; Baran et al., 2011). It is important to enhance and support teachers’ digital and educational competencies, especially those that might be beyond their ordinary practice or expertise (compare Alur, Fatima & Joseph, 2002). Such ways of dealing with transition can lead to a sustainable, step-by-step implementation process and can become a driving force for teachers’ further transitional actions. Moreover, even if bottom-up initiatives are spreading only at the individual level, small, innovative steps can also spread on the collective level.

**Suggestions for future research**
There are a number of possibilities for continuing this research. As digital technologies can serve as innovative and useful tools for distance education, implementing TEL often demands more fundamental changes in educational practices. As previously pointed out by Kirkwood and Price (2014), a future focus in research could be on educational design as a means to facilitate the
transition to distance education. Another interesting possibility could be for researchers to be involved in the transition and development of new educational designs for educating professional physicians at distance. Preferably, such an approach should be guided by the interventionist methodology developed in the CHAT framework. In this framework, the researcher is directly involved in the transformation process by experimenting on new designs for education together with teachers and students. By using a so-called change laboratory method (Engeström et al., 1996; Hauge & Norenes, 2010), teachers and students, under the researcher’s guidance, can work directly on manifested contradictions in educational practice and thereby come up with local solutions to local problems (see, for example, Engeström & Suntino, 2002; Engeström, 2000; Engeström, 2001). The use of a change laboratory can provide insight into teachers’ and students’ ways of dealing with contradictions and can help researchers contribute directly to practice. Put differently, this process can help transform educational practices from face-to-face to distance education. A third focus for future research could be to explore and observe teachers’ and students’ implementations and change procedures on the action level. For example, researchers could closely observe how teachers and students deal with conflicts and double binds on an everyday basis. This could include step-by-step actions within Engeström’s (1987) different levels of learning. A fourth and final focus for future research could be to investigate the possibilities for designing and implementing mobile learning solutions (Lundin et al., 2010). This would enhance access and flexibility for digital learning materials in the program. Integrating students’ everyday technology tools into the program could, for example, facilitate students’ so-called just-in-time learning when it is distributed in hospitals and clinics during clinical clerkship semesters (compare Lundin et al., 2010).

**Concluding remarks**

Major changes in an educational organization are seldom free of problems (compare Burbules & Callister 2000). As argued by de Lange (2010), an important lesson for research and practice is “how deeply classroom practices need to change in order to integrate digital technology in a successful way. Teachers and students have to engage actively with these tools on a daily basis, and this tool use has to make sense in terms of learning about the subject” (p. 107). The findings in this thesis support de Lange’s conclusion in the context of medical education. Although previous practices can be sustained to some extent, this thesis shows that the transition from face-to-face to distance education requires significant structural and educational transformation work and changes in how education is organized and delivered. In turn, this calls for actors to collectively engage in the transition by experimenting on new methods and designs, in which the mediating power of digital technologies
and TEL facilitates and makes sense to teachers’ instruction and students’ learning at a distance.

Findings in this thesis also show the importance of having an exploratory and longitudinal perspective on transitions, which can provide insight into the smaller steps of an ongoing transition from face-to-face to distance education. As also shown in this thesis, the CHAT theoretical framework serves as a useful analytical tool to combine aspects of a longitudinal perspective and a multi-level analysis when investigating transitions. CHAT proves to offer an explicit set of analytical concepts for producing a deep epistemological understanding of transitions, conflicts and changes in the digitalization of medical education. It helps explain how conflicts occur as driving forces demanding structural and educational transformation work that successively changes the way in which medical education is designed and delivered at a distance.

Before ending this thesis, I will briefly touch upon the possibility of a future occurrence of Learning III in the medical program. Moreover, I will put forth what such a step might require for this and other similar medical programs. Engeström (1987) argued that a complete transformation through Learning III is a rare occurrence that calls for change in the whole activity system. This means a transformation from face-to-face to distance education as a qualitatively new educational activity in the medical program. Both previous research and the findings in this thesis indicate that, in order to reach Learning III, it is important for management to keep supporting teachers and students, both technically and educationally. In other words, management must keep elaborating on the new tools and designs for distance education so that they can be disseminated and sustained in the entire program; cultivate a process that engages teachers, helping them to identify conflicts and experiment with local solutions to these conflicts; and bring about a transition by gradually replacing less useful tools and methods for distance education. Through this process, actors in program would “build an infrastructure around the new object” and thereby “change the dominant activity from inside” (Sannino, 2008, p. 337). That is, the program will develop distance education as a qualitatively new activity in the educational practice of the medical program — learning to be at a distance.
Acknowledgements

There are many people to thank for supporting me during this journey. First, I want to give my greatest gratitude to my supervisors, Anders D. Olofsson, Tor Söderström and Christina Ljungberg. Anders, thank you for your exceptional eye for detail, for teaching me about the academic world and for encouraging me to stay in “pit bull mode” during rough times. It meant everything! Tor, thank you for your exceptional knowledge and insightful comments on the research design and for reminding me about the big picture. Christina, thank you for your ability to put new perspectives on my work and for your valuable knowledge in the medical education context. All three of you have contributed greatly to the development of my thinking.

Special thanks are also due to other people. Many thanks go to Marcia, for cheeseburger dinners and valuable English lessons; Malin, for being the best and most supportive roommate; Ulf and Larsa, for interesting CHAT discussions; and Cissi, for insightful comments and encouragement during the past years (you are now, and will remain, be the only person to have read this capstone a hundred times)! Thank you also to the LICT research group, to the PhD seminar group(s) and to my other colleagues at the Department of Education – you made it such a great place to work! Special thanks also go to Trond Eiliv Hauge, for introducing me to CHAT; Carl-Johan Orre, for putting me on the transformational path; Johan Lundin, for insightful and vital comments as a second reader; Ann-Marie, for administrative support; Ulrika Sahlén, for helping me with the cover art; and Anna and Johanna for valuable discussion during this process. I am also grateful for the teachers, students and management of the medical program at Umeå University. Your time and openness made this thesis possible!

Finally, I am deeply thankful for the invaluable support of my family and friends. To my family, thank you for your endless support; to my friends, thank you for your patience during these years. Thanks as well to Klara for painting the cover art. Finally, Nils, thank you for making the work of this thesis possible and for always being there (hereafter, you can go fishing as much as you want)!

Umeå, September 2015

Fanny Pettersson
References


Amirault, R. J. (2012). Distance learning in the 21st century University: Key issues for leaders and faculty. Quarterly Review of Distance Education, 13(4), 253–265.


Appendix 1: Survey, teachers
Enkätmall lärare - Frågor inför regionaliseringen


There are 52 questions in this survey

### Bakgrundsfrågor

<table>
<thead>
<tr>
<th>1 [A] Ålder *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skriv ditt svar här:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2 [B] Kön: *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Välj bara en av följande:</td>
</tr>
</tbody>
</table>
| Kvinnan
| Man |

<table>
<thead>
<tr>
<th>3 [C] Anställd på termin: *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skriv ditt svar här:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4 [D] Anställningsort/placering: *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Välj bara en av följande:</td>
</tr>
</tbody>
</table>
| Umeå
| Sundsvall
| Sunderbyn
| Östersund |
| 5 | Är du universitetsanställd eller landstingsanställd: *  
Välj bara en av följande:  
- Universitetsanställd  
- Landstingsanställd  
- Jag är både universitetsanställd och landstingsanställd |
|---|---|
| 6 | Hur många år har du arbetat som universitetsanställd/landstingsanställd? *  
Skriv ditt svar här: |
| 7 | Tjänsteår som lärare *  
Skriv ditt svar här: |
| 8 | Tjänsteår som läkare *  
Skriv ditt svar här: |
| 9 | Antal pedagogiska poäng: *  
Skriv ditt svar här: |
| 10 | Vilken är din självskattade datorvana? (1=mycket begränsad, 5=mycket god). *  
Välj det korreka svaret för varje punkt:  
1 2 3 4 5 |
| 11 | Hur många timmar per dag använder du datorn? *  
Skriv ditt svar här: |
| 12 | Hur många timmar per dag använder du internet i  
a. Undervisningssammanhang: *  
Skriv ditt svar här: |
13 [b.]I forskning, kliniskt arbete: *
Skriv ditt svar här:

Välj det korrekta svaret för varje punkt:

<table>
<thead>
<tr>
<th>Användning</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facebook</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Twitter</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moodle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wikipedia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Google</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bloggar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Söker/Läser vetenskapliga artiklar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I kliniskt arbete</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I undervisning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

15 [N] Har du tidigare arbetat med distansutbildning? (1=inte alls 5=i mycket hög grad) *
Välj bara en av följande:

1  2  3  4  5

16 [O] Har du tidigare undervisat via Moodle? (1=inte alls 5=i mycket hög grad) *
Välj bara en av följande:

1  2  3  4  5

Frågor om förberedelser inför regionaliseringen av läkarprogrammet
17 [1] Har du tagit del av några förberedelser inför implementeringen av det regionaliserade läkarprogrammet? *

Välj bara en av följande:

- Ja
- Nej

18 [1.b] Vilka förberedelser har du tagit del av inför implementeringen av det regionaliserade läkarprogrammet? (1=inte alls  5=i mycket hög grad) *

Only answer this question if the following conditions are met:
° Answer was 'Ja' at question '17 [1]' (Har du tagit del av några förberedelser inför implementeringen av det regionaliserade läkarprogrammet?)

Välj det korrekta svaret för varje punkt:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deltagande i utformning av Moodle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IT-seminarium/information om Moodle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Informationsföreläsning om regionaliseringen</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Policydokument</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

19 [1.c] Annat:

Only answer this question if the following conditions are met:
° Answer was 'Ja' at question '17 [1]' (Har du tagit del av några förberedelser inför implementeringen av det regionaliserade läkarprogrammet?)

Skriv ditt svar här:


20 [1.d] Vilka frågor har förberedelserna framför allt berört: (1=inte alls  5=i mycket hög grad) *

Only answer this question if the following conditions are met:
° Answer was 'Ja' at question '17 [1]' (Har du tagit del av några förberedelser inför implementeringen av det regionaliserade läkarprogrammet?)

Välj det korrekta svaret för varje punkt:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tekniska</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pedagogiska</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Juridiska</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
21 [1.e] Annat:
Only answer this question if the following conditions are met:
° Answer was 'Ja' at question '17 [1]' (Har du tagit del av några förberedelser inför implementeringen av det regionaliserade läkarprogrammet?)

Skriv ditt svar här:


22 [2] Anser du att du är förberedd inför regionaliseringen av läkarprogrammet vad gäller införandet av utökat IT-stöd? (1=inte alls 5=i mycket hög grad) *

Välj bara en av följande:

1
2
3
4
5

23 [2b] Av vilka anledningar känner du dig inte förberedd?
Only answer this question if the following conditions are met:
° Answer was at question '22 [2]' (Anser du att du är förberedd inför regionaliseringen av läkarprogrammet vad gäller införandet av utökat IT-stöd? (1=inte alls 5=i mycket hög grad))

Skriv ditt svar här:


Välj bara en av följande:

Nej
En gång
Några gånger
Veckovis
Dagligen


Välj bara en av följande:

Ja
Jag kommer att bli innan vt 2011
Nej
26 [4.b] Kommentera gärna:
Skriv ditt svar här:

27 [5] Känner du dig delaktig i implementeringsfasen av den regionaliserade läkarutbildningen? (1 = inte alls, 5= i mycket hög grad) *
Välj det korreksa svaret för varje punkt:
1 2 3 4 5

28 [5.b] Framför allt i vad?
Only answer this question if the following conditions are met:
° Answer was '4' eller '5' at question '27 [5]' (Känner du dig delaktig i implementeringsfasen av den regionaliserade läkarutbildningen? (1 = inte alls, 5= i mycket hög grad))
Skriv ditt svar här:

29 [5.c] Varför inte? Hade du velat vara mer delaktig?
Only answer this question if the following conditions are met:
° Answer was '1' eller '2' at question '27 [5]' (Känner du dig delaktig i implementeringsfasen av den regionaliserade läkarutbildningen? (1 = inte alls, 5= i mycket hög grad))
Skriv ditt svar här:

Frågor om förväntningar inför regionaliseringen av läkarprogrammet

Skriv ditt svar här:
Skriv ditt svar här:

32 [8] Vilka IT-stödda utbildningsinslag skulle du vilja använda dig av? (1=inte alls  5=i mycket hög grad) *
Välj det korrekta svaret för varje punkt:

1  2  3  4  5
Direktsända (live) föreläsningar/informationsinspelningar
Streamade (förinspelade) föreläsningar/informationsinspelningar
Förberedelser inför case/övning
Simuleringar
Seminarium
Case
Examinationer
Kommunikation med studenterna
Information till studenterna
Övningar

33 [9] Vilka IT-stöd förväntar du dig använda i din undervisning? (1=Inte alls, 5=i mycket hög grad) *
Välj det korrekta svaret för varje punkt:

1  2  3  4  5
Direktsända föreläsningar
Streamade föreläsningar
E-post
Moodleforum (kommunikation mellan lärare och studenter)
Moodleforum (informationskanaler ut)
Chatforum
Videokonferens
Administrativa funktioner

34 [9.b] Är det några andra IT-stöd du förväntar dig använda i din undervisning?
Skriv ditt svar här:

Välj bara en av följande:
- Ja
- Nej

36 [10.b] Om ja, varför och på vilka vis?

Only answer this question if the following conditions are met:
- Answer was 'Ja' at question '35 [10]' (Anser du att det utökade IT-stödet bidrar till att du behöver förändra din undervisning?)

Skriv ditt svar här:

37 [11] Tycker du att det finns tillräckligt organisatoriskt stöd för att göra förändringar i undervisningsarbetet? (1=inte alls  5=i mycket hög grad) *

Välj bara en av följande:
- 1
- 2
- 3
- 4
- 5

38 [11.b] Om ja, på vilka vis?

Only answer this question if the following conditions are met:
- Answer was at question '37 [11]' (Tycker du att det finns tillräckligt organisatoriskt stöd för att göra förändringar i undervisningsarbetet? (1=inte alls  5=i mycket hög grad))

Skriv ditt svar här:
39 [11.c] Om nej, hur skulle du vilja att det var?
Only answer this question if the following conditions are met:
° Answer was at question ‘37 [11]’ (Tycker du att det finns tillräckligt organisatoriskt stöd för att göra förändringar i undervisningsarbetet? (1=inte alls 5=i mycket hög grad))
Skriv ditt svar här:

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

Skriv ditt svar här:

41 [13]Tror du att studerande genom utökat IT-stöd innebär att studieorterna erhåller likvärdiga lärandemöjligheter? (1=inte alls 5=i mycket hög grad) *
Välj bara en av följande:

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

42 [13.b]Om inte, av vilka anledningar?
Only answer this question if the following conditions are met:
° Answer was at question ‘41 [13]’ (Tror du att studerande genom utökat IT-stöd innebär att studieorterna erhåller likvärdiga lärandemöjligheter? (1=inte alls 5=i mycket hög grad))
Skriv ditt svar här:

Frågor om kommunikation i det regionaliserade läkarprogrammet
43 [14] På vilka sätt har du kommunicerat med studenter *fram till regionaliseringen?* (1=inte alls  5=i mycket hög grad) *

Välj det korrekt svar för varje punkt:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Föreläsningstillfällen</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Andra fysiska möten</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mail</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telefon</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Informationsutskick i pappersform</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Videokonferens</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meddelande via Moodle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

44 [15] Hur *förväntar* du dig att kommunicera med studenterna *på din regionaliseringsort* i och med införandet av regionaliseringen? (1=inte alls  5= i mycket hög grad) *

Välj det korrekt svar för varje punkt:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Föreläsningstillfällen</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Andra fysiska möten</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mail</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telefon</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Informationsutskick i pappersform</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Videokonferens</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meddelande via Moodle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

45 [16] Hur *förväntar* du dig att kommunicera med studenterna *på de tre andra orterna* i och med införandet av regionaliseringen? (1=inte alls  5= i mycket hög grad) *

Välj det korrekt svar för varje punkt:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Föreläsningstillfällen</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Andra fysiska möten</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mail</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telefon</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Informationsutskick i pappersform</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Videokonferens</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meddelande via Moodle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
46 [17] I vilken utsträckning tycker du att följande är viktigt för läkarstudenters lärande? (1=ingen betydelse  5=mycket stor betydelse) *

Välj det korrepta svaret för varje punkt:

1 2 3 4 5

Kommunikation mellan student och student
Kommunikation mellan lärare och student
Kommunikation mellan administratör och student

47 [18] I och med regionaliseringen synliggörs undervisnings- och administrativt material på Moodle (exempelvis föreläsningsinnehåll, case uppgifter, administrativt arbete osv.) Hur upplever du detta? *

Skriv ditt svar här:

Frågor om eventuella förändringar i och med regionaliseringen av läkarprogrammet

48 [19] Tror du att studenterna kommer att genomföra sina studier på annat vis genom införandet av utökad IT-stöd? *

Välj bara en av följande:

Ja
Nej

49 [19.b] Om ja, på vilka vis?

Only answer this question if the following conditions are met:
* Answer was 'Ja' at question '48 [19]' (Tror du att studenterna kommer att genomföra sina studier på annat vis genom införandet av utökad IT-stöd?)

Skriv ditt svar här:
50 [20] Tror du att läkarprogrammet kvalitetsmässigt kommer att förändras genom utökad användning av IT-stöd? (1=inte alls 5=imycket hög grad) *

Välj bara en av följande:
1
2
3
4
5

51 [20.b] Om ja, på vilka vis?

Only answer this question if the following conditions are met:
° Answer was at question '50 [20]' (Tror du att läkarprogrammet kvalitetsmässigt kommer att förändras genom utökad användning av IT-stöd? (1=inte alls 5=imycket hög grad))

Skriv ditt svar här:

52 [23] Har du några andra synpunkter eller upplevelser du vill komplettera med?

Skriv ditt svar här:

Tack för din medverkan!

Skicka in din enkät.
Tack för att du svarat på denna enkät.
Appendix 2: Survey, students
Frågor inför regionaliseringen -
Studenter

There are 42 questions in this survey

Bakgrundsfrågor

1 [A] Ålder *
Skriv ditt svar här:

2 [B] Kön: *
Välj bara en av följande:
   Kvinna
   Man

3 [C] För att kunna påminna om samt följa upp enkäten ber vi dig att lämna ditt användarnamn för CAS-inloggning (EX. fape0002).
Skriv ditt svar här:

4 [D] Studieterm: *
Skriv ditt svar här:

5 [E] På vilken ort ska du utföra din kliniska praktik från vt2011 *
Välj bara en av följande:
   Umeå
   Sundsvall
   Sunderbyn
   Östersund

Välj bara en av följande:
   Ja
   Nej
7 [G] Vilken är din självskattade datorvana? (1= mycket begränsad, 5=mycket god). *
Välj det korrekta svaret för varje punkt:

1 2 3 4 5

8 [H] Hur många timmar per dag använder du datorn? *
Skriv ditt svar här:

9 [I] Hur många timmar per dag använder du internet

a. Privat: *
Skriv ditt svar här:

10 [b.] I studiesammanhang: *
Skriv ditt svar här:

11 [J] Vad använder du internet till?
Välj det korrekt svaret för varje punkt:

<table>
<thead>
<tr>
<th>Använder inte alls</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Använder i mycket hög grad</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facebook</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Känner inte till</td>
<td></td>
</tr>
<tr>
<td>Twitter</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moodle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wikipedia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Google</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bloggar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Söker/Läser vetenskapliga artiklar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
12 [K] Har du tidigare studerat på distans? (1=inte alls 5=i mycket hög grad) *
Välj bara en av följande:
1 2 3 4 5

13 [L] Har du tidigare studerat via Moodle? (1=inte alls 5=i mycket hög grad) *
Välj bara en av följande:
1 2 3 4 5

**Frågor om förberedelser inför regionaliseringen av läkarprogrammet**

14 [1] Har du tagit del av några förberedelser inför implementeringen av det regionaliserade läkarprogrammet? (Om nej, gå till fråga 2) *
Välj bara en av följande:
   Ja
   Nej

15 [1.b] Om ja, vilka förberedelser har du tagit del av inför implementeringen av det regionaliserade läkarprogrammet? (1=inte alls 5=i hög grad)
Välj det korrekta svaret för varje punkt:

<table>
<thead>
<tr>
<th>Deltagande i utformning av Moodle</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT-seminarium/information om Moodle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Informationsföreläsning om regionaliseringen</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Policydokument</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
16 [1.c] Annat:
Skriv ditt svar här:

17 [2] Anser du att du är förberedd inför regionaliseringen av läkarprogrammet vad gäller införandet av utökat IT-stöd? (1=Inte alls 5=i mycket hög grad)
Välj bara en av följande:

1
2
3
4
5

18 [2.b] Om du svarat 1-2, av vilka anledningar?
Skriv ditt svar här:

Välj bara en av följande:

Nej
En gång
Några gånger
Veckovis
Dagligen

20 [4] Har läkarprogrammet förberett dig tillräckligt för att studera via Moodle i det regionaliserade läkarprogrammet?
Välj bara en av följande:

Ja
Jag kommer att bli innan vt2011
Nej
21 [4.b]Kommentera gärna:
Skriv ditt svar här:

22 [5]Känner du dig delaktig i implementeringsfasen av den regionaliserade läkarutbildningen? (1 = inte alls, 5= i mycket hög grad)
Välj bara en av följande:
1
2
3
4
5

23 [5.b]Om du svarat 4-5, framför allt i vad?
Skriv ditt svar här:

24 [5.c]Om du svarat 1-2, varför inte? Hade du velat vara mer delaktig?
Skriv ditt svar här:

Frågor om förväntningar inför regionaliseringen av läkarprogrammet

Skriv ditt svar här:
Skriv ditt svar här:

27 [8] Vilka IT-stödda utbildningsinslag skulle du vilja använda dig av? (1=inte alls 5=i mycket hög grad)
Välj det korrekta svaret för varje punkt:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ta del av direktsända (live)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>föreläsningar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ta del av streamade (förinspelade) föreläsningar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Förberedelser</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>inför case/övning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simuleringar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Examinationer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seminarium</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Övningar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Få tillgång till information</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Få tillgång till schema</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kommunikation med lärare</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kommunikation med andra studenter</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Studiesociala sammanhang</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Skriv ditt svar här:
29 [10] Tror du att studier genom utökat IT-stöd innebär att studieorterna erhåller likvärdiga lärandemöjligheter? (1=inte alls 5=í mycket hög grad)
Välj bara en av följande:

1
2
3
4
5

30 [10.b] Om du svarat 1-2, av vilka anledningar?
Skriv ditt svar här:

Frågor om kommunikation i det regionaliserade läkarprogrammet

Välj det korrekt svaret för varje punkt:

Föreläsningstillfällen
Andra fysiska möten
E-post
Chat
Telefon
Informationsutskick i pappersform
Videokonferens
Meddelande via Moodle
### 32 [12] Hur förväntar du dig att kommunicera med lärarna på din regionaliseringsort i och med införandet av regionaliseringen? (1=inte alls 5=i mycket hög grad)
Välj det korrekta svaret för varje punkt:

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vid föreläsningstillfällen i Umeå Andra fysiska möten Mail Chat Telefon Informationsutskick i pappersform Videokonferens Meddelande via Moodle</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 33 [13] Hur förväntar du dig att kommunicera med lärarna på de tre andra orterna i och med införandet av regionaliseringen? (1=inte alls 5=i mycket hög grad)
Välj det korrekta svaret för varje punkt:

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Föreläsningstillfällen Umeå Andra fysiska möten Mail Chat Telefon Informationsutskick i pappersform Videokonferens Meddelande via Moodle</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 34 [14] I vilken utsträckning tycker du att följande är viktigt för läkarstudenters lärande? (1=inte alls, 5=i mycket hög grad)
Välj det korrekta svaret för varje punkt:

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kommunikation mellan student och student Kommunikation mellan lärare och student Kommunikation mellan administratör och student</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Skriv ditt svar här:

36 [16] Vilken betydelse tror du att Moodle som kommunikationsverktyg kommer att ha för att upprätthålla det studiesociala *mellan* regionaliseringsorterna? *
Skriv ditt svar här:

Frågor om eventuella förändringar i och med regionaliseringen av läkarprogrammet

37 [19] Tror du att du kommer att genomföra dina studier på annat vis genom införandet av utökat IT-stöd?
Välj bara en av följande:
   Ja
   Nej

38 [19.b] Om ja, på vilka vis?
Skriv ditt svar här:

39 [20] Tror du att läkarprogrammet kvalitetsmässigt kommer att förändras genom utökad användning av IT-stöd? (1=inte alls 5=imycket hög grad)
Välj bara en av följande:
   1
   2
   3
   4
   5
40 [20.b] Om du svarat 4-5, på vilka vis?
Skriv ditt svar här:

41 [21] Har du några andra synpunkter eller upplevelser du vill komplettera med?
Skriv ditt svar här:

Tack för din medverkan!

42 [*] Kan du tänka dig att delta i en intervjustudie under våren 2011?
Om ja, lämna namn, kontaktuppgifter samt klinisk placeringsort nedan. Deltagandet ersätts med en biobiljett.
Skriv ditt svar här:

Skicka in din enkät.
Tack för att du svarat på denna enkät.
Appendix 3: Survey, administrators
Enkätmall administratörer - Frågor inför regionaliseringen

Vi som distribuerar denna enkät heter Fanny Pettersson (forskarstuderande) och Anders D. Olofsson (docent, och ansvarig forskare i projektet) och arbetar på Pedagogiska institutionen vid Umeå universitet. Föreliggande enkät utgör en del av det avhandlingsprojekt där forskarstuderande Fanny Pettersson under en fyraårs period kommer att följa det regionaliserade läkarprogrammet vid Umeå universitet med fokus på implementering, integrering och användning av digitala teknologier i det regionaliserade läkarprogrammet. Projektet är ett samarbetsprojekt mellan Läkarprogrammet och Pedagogiska institutionen. Projektet ska utifrån vetenskaplig evidens möjliggöra utveckling och förbättring av utbildning och undervisning på det regionaliserade läkarprogrammet.

There are 48 questions in this survey

Bakgrundsfrågor

1 [A]Ålder *
Skriv ditt svar här:

2 [B]Kön: *
Välj bara en av följande:
   Kvinna
   Man

3 [C]Anställd på termin: *
Skriv ditt svar här:

4 [D]Anställningsort/placering: *
Välj bara en av följande:
   Umeå
   Sundsvall
   Sunderbyn
   Östersund
5 [E]Är du universitetsanställd eller landstingsanställd: *
Välj bara en av följande:
- Universitetsanställd
- Landstingsanställd
- Jag är både universitetsanställd och landstingsanställd

6 [F]Hur många år har du arbetat som universitetsanställd/landstingsanställd? *
Skriv ditt svar här:

7 [G]Hur många år har du arbetat med administration på Läkarprogrammet? *
Skriv ditt svar här:

8 [H]Har du läst någon pedagogisk utbildning/kurs? Om ja, hur många poäng? *
Skriv ditt svar här:

9 [J]Vilken är din självskattade datorvana? (1=mycket begränsad, 5=mycket god). *
Välj det korrekt svaret för varje punkt:
1 2 3 4 5

10 [K]Hur många timmar per dag använder du datorn? *
Skriv ditt svar här:

11 [L]Hur många timmar per dag använder du internet i administrativt arbete? *
Skriv ditt svar här:
Välj det korreka svaret för varje punkt:

<table>
<thead>
<tr>
<th>Facebook</th>
<th>Twitter</th>
<th>Moodle</th>
<th>Google</th>
<th>Söker/Läser vetenskapliga artiklar</th>
<th>I mitt administrativa arbete</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Använder inte alls</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 Använder i mycket hög grad</td>
<td>Känner inte till</td>
</tr>
</tbody>
</table>

13 [N] Har du tidigare arbetat med distansutbildning? (1=inte alls 5=I mycket hög grad) *
Välj bara en av följande:

1 2 3 4 5

14 [O] Har du tidigare utfört administrativt arbete via Moodle? (1=inte alls 5=i mycket hög grad) *
Välj bara en av följande:

1 2 3 4 5

Frågor om förberedelser inför regionaliseringen av läkarprogrammet

15 [1] Har du tagit del av några förberedelser inför implementeringen av det regionaliserade läkarprogrammet? *
Välj bara en av följande:

Ja
Nej
16 [1.b] Vilka förberedelser har du tagit del av inför implementeringen av det regionaliserade läkarprogrammet? (1=inte alls 5=i mycket hög grad) *

Only answer this question if the following conditions are met:
° Answer was ’Ja’ at question ’15 [1]’ (Har du tagit del av några förberedelser inför implementeringen av det regionaliserade läkarprogrammet?)

Välj det korrepta svaret för varje punkt:

1 2 3 4 5

Deltagande utformning av Moodle
IT-seminarium/information om Moodle
Informationsföreläsning om regionaliseringen
Policydokument

17 [1.c] Annat:

Only answer this question if the following conditions are met:
° Answer was ’Ja’ at question ’15 [1]’ (Har du tagit del av några förberedelser inför implementeringen av det regionaliserade läkarprogrammet?)

Skriv ditt svar här:

18 [1.d] Vilka frågor har förberedelserna framför allt berört (1=inte alls 5=i mycket hög grad): *

Only answer this question if the following conditions are met:
° Answer was ’Ja’ at question ’15 [1]’ (Har du tagit del av några förberedelser inför implementeringen av det regionaliserade läkarprogrammet?)

Välj det korrepta svaret för varje punkt:

1 2 3 4 5

Tekniska
Pedagogiska
Juridiska
19 [1.e] Annat:
Only answer this question if the following conditions are met:
° Answer was ‘Ja’ at question ’15 [1]’ (Har du tagit del av några förberedelser inför implementeringen av det regionaliserade läkarprogrammet?)
Skriv ditt svar här:

20 [2] Anser du att du är väl förberedd inför regionaliseringen av läkarprogrammet vad gäller införandet av utökat IT-stöd? (1=inte alls 5=i mycket hög grad) *
Välj bara en av följande:
1 2 3 4 5

21 [2b] Av vilka anledningar känner du dig inte förberedd?
Only answer this question if the following conditions are met:
° Answer was at question '20 [2]' (Anser du att du är väl förberedd inför regionaliseringen av läkarprogrammet vad gäller införandet av utökat IT-stöd? (1=inte alls 5=i mycket hög grad) )
Skriv ditt svar här:

Välj bara en av följande:
Nej
En gång
Några gånger
Veckovis
Dagligen

Välj bara en av följande:
Ja
Jag kommer att bli innan vt 2011
Nej
24 [4.b] Kommentera gärna:
Skriv ditt svar här:

25 [5] Känner du dig delaktig i implementeringsfasen av de regionaliserade läkarutbildningen? (1 = inte alls, 5= i mycket hög grad) *
Välj det korrektta svaret för varje punkt:
1  2  3  4  5

26 [5.b] Framför allt i vad?
Only answer this question if the following conditions are met:
° Answer was '4' eller '5' at question '25 [5]' (Känner du dig delaktig i implementeringsfasen av de regionaliserade läkarutbildningen? (1 = inte alls, 5= i mycket hög grad))
Skriv ditt svar här:

27 [6.c] Varför inte? Hade du velat vara mer delaktig?
Only answer this question if the following conditions are met:
° Answer was '1' eller '2' at question '25 [5]' (Känner du dig delaktig i implementeringsfasen av de regionaliserade läkarutbildningen? (1 = inte alls, 5= i mycket hög grad))
Skriv ditt svar här:

Frågor om förväntningar inför regionaliseringen av läkarprogrammet

Skriv ditt svar här:
Skriv ditt svar här:

30 [9] Vilka IT-stödda inslag skulle du vilja använda dig av i ditt administrativa arbete? (1=inte alls 5=i mycket hög grad) *
Välj det korrekte svaret för varje punkt:

1 2 3 4 5
Direktsända (live) föreläsningar/informationsinspelningar
Streamade (förinspelade) föreläsningar/informationsinspelningar
Kommunikation med studenterna
Information till studenterna
Administrativa uppgifter
(betygsrapportering etc.)

31 [10] Vilka IT-stöd förväntar du dig använda i administrationen av de regionaliserade läkarprogrammet? (1=Inte alls, 5=i mycket hög grad) *
Välj det korrekte svaret för varje punkt:

1 2 3 4 5
Direktsända föreläsningar
Streamade föreläsningar
E-post
Moodleforum (kommunikation mellan lärare och studenter)
Moodleforum (informationskanaler ut)
Chatforum
Videokonferens
Administrativa funktioner

32 [10.b] Är det några andra administrativa uppgifter du förväntar dig att utföra via IT-stöd i det regionaliserade läkarprogrammet?
Skriv ditt svar här:
Välj bara en av följande:
   Ja
   Nej

34 [11.b] Om ja, varför och på vilka vis?
Only answer this question if the following conditions are met:
   ° Answer was 'Ja' at question '33 [11]' (Anser du att det utökade IT-stödet bidrar till att du behöver förändra ditt administrativa arbetssätt?)
Skriv ditt svar här:

35 [12] Tycker du att det finns tillräckligt organisatoriskt stöd för att göra förändringar i det administrativa arbetet? (1=inte alls  5=يمي mycket hög grad) *
Välj bara en av följande:
   1
   2
   3
   4
   5

36 [12.b] Om ja, på vilka vis?
Only answer this question if the following conditions are met:
   ° Answer was at question '35 [12]' (Tycker du att det finns tillräckligt organisatoriskt stöd för att göra förändringar i det administrativa arbetet? (1=inte alls  5=يمي mycket hög grad))
Skriv ditt svar här:
37 [12c] Om nej, hur skulle du vilja att det var?

Only answer this question if the following conditions are met:
° Answer was at question '35 [12]' (Tycker du att det finns tillräckligt organisatoriskt stöd för att göra förändringar i det administrativa arbetet? (1=inte alls 5=i mycket hög grad))

Skriv ditt svar här:

Frågor om kommunikation i det regionaliserade läkarprogrammet

38 [13] På vilka sätt har du kommunicerat med studenter fram till regionaliseringen? (1=inte alls 5=i mycket hög grad) *

Välj det korrepta svaret för varje punkt:

1 2 3 4 5

- Föreläsningstillfällen
- Andra fysiska möten
- Mail
- Chat
- Telefon
- Informationsutskick i pappersform
- Videokonferens
- Meddelande via Moodle

39 [14] Hur förväntar du dig att kommunicera med studenterna på din regionaliseringsorti och med införandet av regionaliseringen? (1=inte alls 5=i mycket hög grad) *

Välj det korrepta svaret för varje punkt:

1 2 3 4 5

- Föreläsningstillfällen
- Andra fysiska möten
- Mail
- Chat
- Telefon
- Informationsutskick i pappersform
- Videokonferens
- Meddelande via Moodle
40 [15] Hur förväntar du dig att kommunicera med studenterna på de tre andra orterna i och med införandet av regionaliseringen? (1=inte alls  5=i mycket hög grad) *
Välj det korrekt svaret för varje punkt:

1 2 3 4 5

Föreläsningstillfällen
Andra fysiska möten
Mail
Chat
Telefon
Informationsutskick i pappersform
Videokonferens
Meddelande via Moodle

41 [16] I och med regionaliseringen synliggörs undervisnings- och administrationsmaterial på Moodle (exempelvis föreläsningstillfälle, case uppgifter, administrativt arbete osv.) Hur upplever du detta? *
Skriv ditt svar här:

Frågor om eventuella förändringar i och med regionaliseringen av läkarprogrammet

42 [17] Tror du att studenterna kommer att genomföra sina studier på annat vis genom införandet av utökat IT-stöd? *
Välj bara en av följande:

- Ja
- Nej

43 [17.4] Om ja, på vilka vis?
Only answer this question if the following conditions are met:
° Answer was 'Ja' at question '42 [17]' (Tror du att studenterna kommer att genomföra sina studier på annat vis genom införandet av utökat IT-stöd?)
Skriv ditt svar här:
44 [18] Tror du att studenterna kommer att tillgodogöra sig information om programmet på annat vis genom införandet av utökat IT-stöd? *
Välj bara en av följande:
   Ja
   Nej

45 [18.b] Om ja, på vilka vis?
Only answer this question if the following conditions are met:
° Answer was ‘Ja’ at question ’44 [18]’ (Tror du att studenterna kommer att tillgodogöra sig information om programmet på annat vis genom införandet av utökat IT-stöd?)
Skriv ditt svar här:

46 [20] Tror du att läkarprogrammet kvalitetsmässigt kommer att förändras genom utökad användning av IT-stöd? (1=inte alls  5=i mycket hög grad) *
Välj bara en av följande:
   1
   2
   3
   4
   5

47 [20.b] Om ja, på vilka vis?
Only answer this question if the following conditions are met:
° Answer was at question ’46 [20]’ (Tror du att läkarprogrammet kvalitetsmässigt kommer att förändras genom utökad användning av IT-stöd? (1=inte alls  5=i mycket hög grad))
Skriv ditt svar här:

48 [23] Har du några andra synpunkter eller upplevelser du vill komplettera med?
Skriv ditt svar här:
Tack för din medverkan!

Skicka in din enkät.
Tack för att du svarat på denna enkät.
Appendix 4: Interview guide, teachers

Möjliga följdfrågor är kursiverade.

Bakgrund – utbildningsform och undervisning

Kan du ur ett historiskt perspektiv beskriva hur undervisningen varit upplagd på läkarutbildningen? Hur ser den ut idag?

Kan du beskriva din roll som lärare? **Vilka egenskaper är viktiga för studenter att få med sig under utbildningen för att bli en bra läkare?** Vad är viktigt undervisningsmässigt för att bli en bra läkare? Vad blir viktigt i undervisningen? Vad blir viktigt i relationen mellan lärare och student?

Digitalisering och digitala teknologier i bruk

Hur tänkte/tänker du initialt kring integreringen och användningen av digitala teknologier? **Vilken var tanken initialt att digitala teknologier skulle användas till, hur, till vilka moment? Möjligheter och begränsningar?**

Hur planerar och genomför du din undervisning idag (med hjälp av teknologier)? **Vilka digitala teknologier använder du, och hur, i din dagliga undervisning? Ge exempel.**

Vilken typ av undervisning/ lärande kan man uppnå med användning av de digitala teknologierna? **På vilka vis anser du att teknologierna kan användas?** Hur ser du på användningen av digitala teknologier för seminarium, kommunikation? **Vilket lärande/kunskaper får man ut av det?**

Vilka farhågor fanns vid uppstart? **Hur resonerade ni i lärarlaget?** Vilken stöttning fanns från ledningen och programmets sida?

Har det uppstått några problem vid integreringen och användningen? **Hur har det påverkat undervisningen, lärandet?** **Vilka har problemen varit och hur har du/ni arbetat för överkomma dessa?** **Hur har ni resonerat/arbetat med detta i lärarlaget? Stöttning från ledning?**

Kan du genom digitala teknologier genomföra din undervisning på samma vis som förut? **Möjliggör användningen av digitala teknologier andra sätt att genomföra undervisningen?**
Kräver/medför digitaliseringen att du gör några strukturella eller pedagogiska förändringar i din undervisning? *Ge exempel.*

Använder du Moodle till andra arbetsuppgifter än undervisning (t ex diskussioner med andra lärare, dela erfarenheter)?

Använder ni digitala teknologier för att lösa uppgifter inom lärarlaget? Om ja, till vilka uppgifter och hur gör ni då? *Ser du några fördelar med Moodle vad gäller att kunna ta del av andra lärares material och sätt att använda digitala teknologier? Påverkar den ökade insynen hur du använder teknologierna eller förbereder undervisning?*

Hur ser du på betydelsen av traditionella föreläsningar, live sända föreläsningar, Moodle, inspelade föreläsningar, för studenternas lärande?

Hur använde du teknologier i undervisningen innan RLU, till vilka moment? *Har den nya utbildningsformen med väsentliga inslag av digitala teknologier förändrat dina föreställningar om undervisning och lärande? Ex vilka kunskaper och moment? Om ja, vad har det berott på? Om nej, varför?*

**Förändringsprocesser**

Har programmet påverkats av utökad användning av digitala teknologier? *Vad har förändringarna betytt för läkarprogrammet som helhet? Vilka förändringar förväntades innan RLU?*

Har det startats andra förändringsprocesser på grund av RLU och den utökade teknologianvändningen?

**Roller, studenters lärande/användning**

Beskriv hur du anser att studenterna bör använda Moodle/de digitala resurserna i sina studier.

Hur påverkas relationen mellan lärare och studenter? *Får studenterna något annat ansvar för sina studier i och med RLU och digitaliseringen (förnackdelar med det)? Om ja, gällande exempelvis och varför?*

Påverkar den nya utbildningsformen vilka läkare ni utexaminerar? *Är det några kunskaper som påverkas av den nya utbildningsformen?*
Vilken möjlighet ser du att integrera sociala medier i utbildningen? Hur ser du på studenternas Facebook användning? Anser du att ni har något ansvar för studenternas Facebook användning?
Appendix 5: Interview guide, students

Möjliga följdfågor är kursiverade.

Bakgrund – undervisning och lärande

Kan du beskriva hur den (teoretiska) undervisningen varit upplagd på läkarprogrammet innan RLU och digitaliseringen.


Hur värderar du olika undervisningsformer? Vilken betydelse har t ex katedral föreläsningsform för ditt lärande kontra andra studieformer såsom case, seminarium etc.?

Beskriv hur du studerar du inför ett case, seminarium, examination?

Digitalisering och digitala teknologier i bruk

Kan du beskriva hur den (teoretiska) undervisningen ser ut idag (med hjälp av digitala teknologier)? Hur planerar och genomför du dina studier idag?


Hur och för vad använder du olika digitala resurser? (Ge exempel) Vilka kunskaper/lärande anser du att resurserna kan stöta? Vilka för- eller nackdelar ser du med användningen för dina studier?


Vilka möjligheter och begränsningar har du/ni stött på vid integreringen och användningen av digitala resurser? Vilka problem har uppstått? Hur har dessa påverkat undervisningen och dina studier? Hur har du/andra aktörer arbetat för att lösa dessa?
Webbseminarium och diskussioner förekommer i väldigt liten utsträckning, varför? Visa log data.

Använder du Wikipedia, Google eller andra internetkällor för att söka kunskap? Om ja, varför/för vad och på vilka vis?

Har införandet av digitala teknologier inneburit (/krävt) några förändringar i ditt sätt att studera? Vad har stöttat/bidragit till denna förändring?


**Roller, rollfördelning**

Vilken betydelse har dina studiekamrater för ditt lärande? *Hur har detta påverkats i och med digitaliseringen och det nya distansformatet? Inom och mellan orter.*


Beskriv lärarnas sätt att undervisa på distans/deras sätt att stötta dina studier på distans. *Möjligheter/begränsningar för ditt lärande. Har detta förändrats i och med RLU och digitaliseringen?*

Hur ser ansvaret och rollfördelningen ut för era studier nu jämfört med innan RLU och digitaliseringen?


Hur ser förutsättningarna ut på de olika orterna? Ges samma förutsättningar och ställs samma krav?

**Grupptillhörighet**

Håller du kontakten med dina studiekamrater (inom och mellan orterna)? *Hur gör du då? Har distansformatet ökat eller minskat närheten till dina studiekamrater (inom och mellan orterna)?
Vilken betydelse har sociala medier för ditt lärande och känsla av grupptillhörighet?

I den enkät som distribuerades till studenter på termin 6 i januari menade en tredjedel av de som besvarade frågan att Moodle skulle få betydelse för det studiesociala mellan orterna. *Hur ser det ut idag (visa log data)?* *Hur borde Moodle vara utformad för att stötta det studiesociala inom och mellan studieorterna?*

Används andra sociala medier för att återupprätthålla det studiesociala inom och mellan orter? *Hur används det och för vad?* *Vilka möjligheter och begränsningar ser du med Facebook/andra sociala medier som studiesocialt verktyg?* Vad skulle du tycka om Läkarprogrammet skulle vara aktiva på Facebook, exempelvis lägga ut utbildningsmaterial, diskussionsgrupper etc.?
Appendix 6: Interview guide, management

Bakgrundsfrågor
Älder.
Universitet/landstingsanställd.
Tjänsteår som lärare, läkare, ledningsuppdrag.
Tidigare erfarenhet av distansutbildning/digitalisering av utbildning eller organisation.

Möjliga följfrågor är kursiverade.

Bakgrund, förberedelser och förväntningar

Kan du ur ett historiskt perspektiv beskriva programmet och utbildningspraktiken. Hur skulle du beskriva den idag?

Kan du berätta om dina initiala tankar kring en regionalisering och digitalisering av programmet?

Hur har du tänkt kring förberedelserna inför en regionalisering och digitalisering? Hur har fakultetsledningen agerat vad gäller förberedelser? Vilka förberedelser har man erbjudit/vad har det inneburit? Vilka krav har ställts på programorganisationen?

Hur har digitaliseringen bemötts av lärarkåren? Hur tänker du kring deras förutsättningar att utföra undervisningsuppdraget genom digitala teknologier? Vilka tekniska, pedagogiska förutsättningar har funnits? Enligt enkäter som distribuerades i januari är erfarenheten av distansutbildning och undervisning via t ex Moodle liten bland lärare. Trots det känner de sig förberedda inför detta, vad tror du detta beror på? Hur har lärare stöttats?

Vilka ekonomiska, tidsmässiga och kompetensmässiga förutsättningar har funnits för en digitalisering och hur ser du på detta? Vad har ni framför allt lagt fokus på inför processen? Kan man hålla uppe balansen i tid, arbetsbelastning och ekonomin och hur tänker du inför framtiden?

Vilka farhågor fanns vid uppstart? Vilka problem har uppstått och hur har ni arbetat för överkomma dessa?
**Digitaliseringen**

Hur tänker/har ni tänkt att de olika teknologierna ska integreras och användas i utbildningen? Vilka mål finns med integreringen och användningen?

Vilka problem, konflikter och motgångar har uppstått och förväntas uppstå under digitaliseringsprocessen? *Hur bearbetats dessa? Hur påverkas programmet, ledningen och andra aktörer av detta?*


Hur ser du på samarbetet med Pedagogiska institutionen? *Fördelar, nackdelar. Hur tänker man inför framtiden? Vilka konsekvenser har det fått (för utbildningen i stort)?*

Till studenter på läkarprogrammet vid Umeå universitet

Hej!

Vi som skriver detta brev heter Fanny Pettersson (forskarstuderande) och Anders D. Olofsson (docent, och ansvarig forskare i projektet) och arbetar på Pedagogiska institutionen vid Umeå universitet.


Projektet är ett viktigt inslag för att höja kvaliteten på det regionaliserade läkarprogrammet vid Umeå universitet. Projektet ska utifrån vetenskaplig evidens möjliggöra utveckling och förbättring av utbildning och undervisning på det regionaliserade läkarprogrammet. Forskningsresultaten ska vidare bidra till att utveckla inslag av de digitala teknologier vilka har visat potential att kunna förhöja lärandet och utveckla programmets undervisningspraktik. Detta förutsätter dock alltså möjligheter till datainsamlingar under avhandlingsarbetet.

Som en del i projektet planeras att under tre till fyra terminer med start under senare del av ht-2010 att studera användarmönster på moodle. Datainsamlingen avser samla in kvantitativ data. Det centrala i denna specifika studie är att ta reda på vilka resurser (streamade filmer, informationsforum, kommunikationsforum osv.) som används, hur ofta, av hur många och vid vilka tidpunkter. Studierna av användarmönster utförs endast på gruppnivå vilket innebär att varken vi som arbetar som forskare i projektet eller någon annan aldrig kommer att kunna identifiera enskilda individers användning och aktivitet i Moodle. Deltagandet är helt frivilligt och kan inte påverka lärarnas bedömning av studieresultat. Det är också möjligt att vid varje tidpunkt kontakta ansvariga forskare och avbryta medverkan i projektet.

Har du frågor om projektet är du självklart välkommen att ringa eller skriva till såväl Pettersson som Olofsson.

Tack för att du tog dig tid att läsa denna information och lycka till med dina studier!

Med vänliga hälsningar,

Fanny och Anders

fanny.pettersson@pedag.umu.se anders.d.olofsson@pedag.umu.se

090-786 77 05, 070-24 11 549 090-786 78 09


68. Forsberg, Ulla. Är det någon "könsordning" i skolan? Analys av könsdiskurser i etniskt homogen och etniskt heterogen elevgrupper i årskurserna 0-6. 2002.


89. Ärlestig, Helene. Communication Between Principals and Teachers in Successful Schools. 2008.


113. Stenling, Cecilia. The Drive for Change – Putting the means and ends of sports at stake in the organizing of Swedish voluntary sports. 2015.