This thesis takes a Science and Technology Studies and Actor-Network-Theory approach to researching the mergers of a knowledge sharing system and a Danish business college. The thesis builds on a long-term praxiographic study and presents ways to understand the enactments of the Studynet and HBC as well as their interobjectively enacted relationships. The concept of movements rather than changes is introduced to emphasize that enacting relationships between education and ICTs involve complex and manifolded processes of (dis-)engagement work. Adding STS/ANT to e-learning research and moving focus from effects of and with ICTs to ICTs and e-learning as effects is new. Only recently have educational researchers in Denmark begun to gain/articulate inspiration from and engagements with STS/ANT, also bringing ANT into e-learning science may be viewed as quite a new move.
Mikala Hansbøl

Researching Relationships between ICTs and Education: Suggestions for a Science ‘of’ Movements

PhD dissertation
Danish School of Education, Aarhus University, Denmark
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PREFACE AND ACKNOWLEDGEMENTS

This thesis was written as part of an Industrial PhD studentship I participated in from 15 April 2004 to 30 April 2008.¹ As an Industrial PhD student, my time was divided between the Public Sector and the Education Team at Microsoft Denmark as an employee and the then Department of Educational Anthropology at the Danish University of Education as a PhD student.² The Industrial PhD initiative was funded by Microsoft Denmark and the Danish Ministry of Science, Technology and Innovation.

The research project associated with this PhD thesis was initiated by Microsoft Denmark in collaboration with me and the research program Media and ICT in a Learning Perspective at the Danish School of Education, Aarhus University. I am the only researcher associated with the project, which we gave the name Project Learning Scenarios with Information and Communication Technologies.

Many people have contributed in a variety of ways to the realization of this thesis, and though it is not possible to mention everyone, I do wish to specifically express my gratitude to a number of people.

The people at the business college, which at the time was called Hillerød Handelsskole (Hillerød Business College), are one of the main reasons why it was possible to engage in this research. I owe practically everything to the wonderful students, teachers, school leaders, IT support staff, the e-learning coordinator and the head of quality and communication, all of whom dared to share different aspects of their professional lives with me. Hans Jørgen Wulff, head of quality and communication, was the person who opened the door for me to become involved with the college’s daily activities. He has in many ways participated in making this research possible and I owe him my heartfelt thanks, especially for reading and commenting on my thesis.

¹ An Industrial PhD project is conducted in cooperation between a private company, an Industrial PhD student and a university. In this case the research focuses on the ways in which an ICT system based on Microsoft products became part of and took part in moving everyday living in the programs at a Danish business college. This thesis focuses on the academic contributions of this research. A separate business report focuses on operationalizing the research results in relation to the company’s commercial interests. For more information see: http://en.fi.dk/research/industrial-phd-programme/the-industrial-phd/what-is-an-industrial-phd
² Since merging with Aarhus University in 2008, the Danish University of Education is now called the Danish School of Education Aarhus University.
In 2004 I became the first Industrial PhD student at Microsoft Denmark. The Public Sector director, Dan Bælum, the education manager at the time, Henrik Nerup Rant, and the Education Team, which consisted of my enterprise supervisor, Kamilla Jørning Roost, the Danish Partners in Learning (PIL) program manager, Kirsten Panton, and technical specialist Torben Andersen, account manager Mikael Dalsgaard, and tele account manager Nikolaj Lysgaard Andersen, constituted the group of people who were committed on a daily basis to the idea of having an Industrial PhD student associated with the Education Team. Collaborating with these creative people and engaging firsthand with the complicated everyday living related to a global enterprise like Microsoft Corporation has been a great experience for me. I owe my Microsoft Denmark colleagues particular thanks for their great patience and understanding. The pace of writing a PhD thesis is much slower than the daily work associated with working at Microsoft. Thanks are also owed to the current PIL manager, David Garde-Tschertok, for reading and commenting on my thesis as well as to the current Education Team manager, Julich Wiberg, who supported me during the slow progression of my work even though we did not get to know one another until my formal contract with Microsoft Denmark ended.

Approximately two and a half years into the PhD program, I changed my theoretical basis to actor-network-theory (ANT). This fundamental change would not have been possible without the ANT study group at the Danish School of Education, which consisted of PhD students Nana Benjaminsen, Katia Dupret Søndergaard and Jesper Hundebøl, to whom I am grateful for many hours of intensive and inspiring discussions. I also wish to thank Casper Bruun Jensen for reading and commenting on parts of the manuscript.

My enterprise supervisor, Kamilla Jørning Roost, university co-supervisor, Estrid Sørensen, and the head university supervisor, Birgitte Holm Sørensen, have provided nothing but encouragement, demonstrated confidence and offered support for my explorative way of handling things.

Over the years, the research program Media and ICT in a Learning Perspective has been a stimulating and safe environment that provided significant stepping stones for treading into deep and wild waters.

Even though all of the discussions that have taken place and the comments that have been made have been helpful, there is no clear pathway between them and what has or has not been included. Consequently, I am entirely responsible for any mistakes or any impossible (dis-)assemblages in this thesis.

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3 Camilla, who was initially an account manager, later became the overall Education Team manager.
Last (but not least!), thank you to my family and friends – especially my father, Gorm Hansbøl. My father has been of invaluable support, especially with regard to reading and commenting on the thesis, in addition to helping me believe in the final version. My husband, Brian, has been an inestimable discussion partner along the way. I dedicate this thesis to Brian and our daughter Kasandra, who are everything to me. I love them and look forward to being more present to them in the future. They have supported me in every way, even when Kasandra sometimes had to leave my home office with her dad, commenting at the age of two years and eight months: “Let’s go dad, mom’s not home”, even though I was sitting right there. Apart from one year of maternity leave, this thesis has been a part of Kasandra’s life for much too long.

I hope that this thesis will contribute to giving back some of what I have received and will spur ideas in the daily lives of others and the people who have helped me.

*Mikala Hansbøl, December 2009*
DANSK RESUMÉ

E-læring er tæt forbundet med forestillingen om informations- og kommunikationsteknologier (ikt’er) som forandringsagenter. I denne afhandling diskuterer denne tilgang og jeg foreslår via en *Science- and Technology Studies* og *Aktør-Netværks-Theoretisk*-inspireret tilgang, at undersøgelse af hvordan ikt’er bliver deltager i og er med til at bevæge hverdagslivet i uddannelsessammenhænge, må tage afsæt i en tilgang, der positionerer ikt’er som praksisser i stedet for i praksisser. Ikt’er og e-læring bliver i denne tilgang betragtet som effekter af etableringen af sociomaterielle forbindelsessammenhænge. Dette præsenteres som værende noget andet end at tage afsæt i ikt’er og e-læring som noget med effekter.


- fokus på Studienettet som aktør
- en relationel og processuel forskningstilgang
- et relationelt og komplekst udfoldet begreb om bevægelser og engagementsarbejde
- fokus på skiftende videns- og engagementssammenhænge
- fokus på de skiftende specificteter, der (dis-)engagerer Studienettet som aktør
- fokus på partielt eksisterende translationer og forbindelser
- blik for variationer af relevansen af, (dis-)engagementer med og partielle forbindelser samt afbrydelser af forbindelser til/fra Studienettet
- ontologisk multiplicitet

Konkret tager forskningsprojektet afsæt i arbejdet med at integrere Studienettet i HHX- og HG- uddannelserne ved Hillerød Handelsskole. Formålet med afhandlingen er at besvare spørgsmålet:

*På hvilke måder bliver et videndelingsystem en del af og tager del i at bevæge hverdagslivet i ungdomsuddannelserne ved en dansk handelsskole?*

Udbredelsen af såkaldte videndelingsystemer i uddannelsessystemerne i DK er forøget kraftigt siden årtusindeskiftet. Der kan findes mange påstande om disse systemers kvaliteter, men der mangler både i Danmark og internationalt, viden om de konkrete måder hvormed videndelingsystemer *fungerer* i praksis.
Eksisterende viden om it-integration, e-læring og videndelingsystemer i ungdomsuddannelserne i Danmark tager først og fremmest afsæt i generaliserende tilgange, der slet ikke beskæftiger sig med hvilke ikt’er, der er tale om. Afhandlingen problematiserer disse og argumenterer for, at der er behov for at fokusere på specificiteterne af arbejdet med ikt’er i danske uddannelsessammenhænge.

Dansk e-læringsforskning har i de senere år favoriseret såkaldt (social-) konstruktivistiske uddannelsestilgange, og dette præsenteres i afhandlingen som værende én måde at sætte rammerne for engagementsarbejde med ikt’er i uddannelser, der ikke nødvendigvis kan eller bør repræsentere eller generaliseres til alle uddannelsessammenhænge. Herudover argumenteres der for at hvis intentionen er at forstå hvordan relationer mellem ikt’er og uddannelse etableres, og ydermere forstå de bevægelser som koblinger mellem ikt’er og uddannelser medfører, er det nødvendigt med en tilgang, der ikke på forhånd har valgt et verdenssyn – som der ellers er tradition for i kvalitativ uddannelsesforskning og e-læringsforskning. Med denne pointe in mente foreslås at bevægelser og engagementarbejde kan være konstruktive begreber, der ikke på forhånd indikerer hvilke relationer og forhold, der er i spil. Herudover argumenteres der for, at som erstatning for den mere eller mindre traditionelle forståelse af ikt’er som objekter med bestemt agens (positiv eller negativ, god eller dårlig) må fokus i en relationel og processuel tilgang rettes mod de skiftende ontologisk multiple agentialiseringsprocesser og konstituerende infiltrationer, der er med til at (dis-) engagere ikt’er i uddannelseshverdagen.

Med dette som afsæt analyseres forskellige konkrete engagementssammenhænge ved Hillerød Handelsskole:

Kapitel 1 handler om matematik i Frederikssundsafdelingen af Hillerød Handelsskole. Kapitlet illustrerer en situation, hvor Studienettet delvist disengageres fra uddannelseshverdagen blandt andet på grund af manglende tilgange til computere og internetforbindelser på skolen, på grund af elevernes problemer med at få adgang til Studienettet hjemmefra, og fordi det matematikprogram (Mathcad), der arbejdes med ikke er kompatibel med Studienettet.

I kapitel 2 diskuteres forskellige præsentationer af Studienettet, der alle tager afsæt i Studienettet som en platform, hvorfra og -med der kan handles. Denne tilgang diskuteres og det foreslås at der skiftes blik til skiftende platformationer af Studienettet.

Vignetterne 1 og 2 handler om de Science and Technology Studies (STS) og Aktør-Netværks-Teori (ANT) ressourcer, som afhandlingen relaterer til og delvist trækker på. Forbindelsen mellem uddannelsesforskning og STS/ANT samt mellem medie- og it-
forskning og STS/ANT præsenteres som ny. Inspireret af denne tilgang præsenteres enhver ekistensform som bevæget, bevægende, og værende i bevægelse, og der præsenteres et forslag til udvikling af videnskab i bevægelser / bevægelsernes videnskab. En videnskabstildgang, der hverken er grundred eller grundløs.

Kapitel 3 viser eksempler på, hvordan introduktionen af Studienettet som platformen for opgaveaflevering og strukturering af kommunikation om undervisningsaktiviteter får betydning for læreres måder at anvende Studienettet i undervisningen. Samtidig illustrerer eksemplerne, hvordan der etableres passager med Studienettet til at arbejde med for eksempel opgaveafleveringer, der kvalitativt forandrer det at håndtere og engagere sig i opgaver.

I Kapitel 4 diskuteres eksempler på hvordan opmærksomheden ved Hillerød Handelsskole skifter mellem at få Studienettet til at fungere (få funktionaliteter til at virke) og at rekonfigurere hvad det vil sige at ’ting’ fungerer. Kapitlet illustrerer, hvordan det at etablere relationer mellem Studienettet og hverdagslivet ved Hillerød Handelsskole handler om at være i løbende forhandlinger og konstruktioner af (in-) kompatibiliteter og reparabiliteter. Frem for at fokusere på hvornår Studienettet fungerer eller ikke, rettes blikket mod multiple og skiftende aspekter af hvad det vil sige at Studienettet virker/fungerer i hverdagslivet. Kapitlet viser, at engagementer mellem Studienettet og Hillerød Handelsskole er med til at delvist rekonfigurere såvel Studienettet som Hillerød Handelsskole.

I Kapitel 5 præsenteres og diskuterer den danske e-læringsforsknings tendens til at se på forandringer i uddannelsessammenhænge som et spørgsmål om at være på én vej, fra instruktivistiske til konstruktiviske uddannelsesformer, ind i det 21. århundrede eller ikke. Dette er en for simplificerende tilgang, og med inspiration fra bl.a. socialantropolog Marilyn Strathern argumenteres der for, at der i e-læringsforskningen er behov for at skifte blikket til den mangfoldighed af bevægelser i uddannelsessammenhænge og dermed også til den mangfoldighed af uddannelsessammenhænge, som er løbende på spil – også i de uddannelsessammenhænge, som af de danske e-læringsforskere i dag karakteriseres som værende engagerede i traditionelle, altså instruktivistiske uddannelsesformer. For at få blik for mangfoldigheden af bevægelser, så må skiftende bevægelser og variationer indeni være i fokus.

Overordnet peger afhandlingen på at udgangspunktet for, vejen til, samt endestationen for at etablere relationer mellem ikt’er og uddannelser hele tiden er i bevægelse. Det skaber udfordringer i uddannelsessammenhænge, der må håndtere disse bevægelser og samtidig sætte retninger for engagementer i ikt’er i uddannelseshverdagen.

I dansk e-læringsforskning karakteriseres uddannelsespraksisser med ikt’er typisk som værende enten konstruktiviste eller instruktivistiske og ‘kun’ remedierende. Afhandlingen stiller spørgsmål ved det udviklingssyn, som remedieringstænkningen præsenterer. I stedet for at arbejde med afsæt i ét syn på, og én teori om, progression og udvikling med ikt’er, argumenteres der for at der sameksisterer mange komplekst sammensatte bevægelser med ikt’er i hverdagslivet ved Hillerød Handelsskole. For at forstå Studienettet og dets skiftende betydninger for, og deltagelsesformer i, hverdagslivet ved Hillerød Handelsskole, må blikket derfor rettes mod disse heterogent sammensatte bevægelser.
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AN INTRODUCTION

How does a knowledge sharing system become part of and take part in moving the everyday ways of living associated with the secondary school programs at a Danish business college?

A knowledge sharing system describes a number of different information and communication technology (ICT) systems that are mostly (today) accessed through the Internet. Knowledge sharing systems have many different names, e.g. knowledge management system, virtual learning environment, intranet, etc., and mostly represent an ICT system that covers several ICT systems, e.g. administrative and content delivery systems. The term knowledge sharing system implies that these systems are viewed as tools/media/contexts for sharing and distributing information in a variety of ways.

Connecting to the Studynet ...

Connecting to the Studynet ...
An introduction

A knowledge sharing system: The Studynet


An introduction

Hillerød Business College (HBC), which falls under the category of vocational college (erhvervsskole), offers both commercial vocational education and training and a commercial upper secondary school program, as well as short commercial tertiary educational programs and adult vocational training (for information on these education programs see: Eurydice, 2005). This research focuses on two kinds of Danish upper secondary school programs: Commercial higher examination (højere handelseksamen (HHX)) and basic vocational (handelsskolernes grunduddannelse (HG)). The basic vocational programs at HBC are commercial vocational education and training programs.

HG is vocational education and training (VET): “The Danish vocational education and training programmes … are [tuition free] alternating or sandwich-type programmes, where practical training in a company alternates with teaching at a vocational college. The programmes consist of a basic and a main programme. The student must enter into a training agreement with a company approved by the social partners (a confederation of representatives of employers and employees) in order to accomplish the main programme. There are approximately 125 vocational education and training programmes (2007) … each of which can lead to a number of vocational specialisations.” Today, the basic program is (2009) gathered into twelve vocational clusters relating to the vocational program. HBC is a commercial business college and would belong under the vocational cluster called business (Merkantil). This cluster covers eight education programs. “The objective of the programmes is described as competencies. All programmes contain at least one area of specialisation composed of specialised subjects. The remainder of the content is built up around the broad professionally oriented subjects and competencies (area subjects) and the fundamental general vocationally oriented subjects (basic subjects) and competencies.”


HHX, a commercial higher examination program, is a three-year upper secondary education program: “The emphasis in the HHX programme is on vocational perspectives. The aim of providing a qualification for academic studies is realised within the areas of business economics and socio-economics combined with foreign languages and other general subjects. The education programme is to develop the students’ capacity for in-depth studies and their understanding of theoretical knowledge as tools for analysing realistic issues.”


For a general presentation of the Danish educational system visit Eurobase: The Information Database on Education Systems in Europe:
An introduction

Project Learning Scenarios with ICTs

My PhD project was called Project Learning Scenarios with Information and Communication Technologies and researched the ways in which a particular (so-called) knowledge sharing system (the Studynet) became an actor in the everyday ways of living associated with commercial upper secondary education programs at Hillerød Business College (Hillerød Handelsskole) in Hillerød, Denmark during the 2004-2005 and 2005-2006 school years.

Originally, the aim of the project was to study cases and develop variations of computer-supported distributed collaborative learning (CSdCL) scenarios at different educational levels. This broad aim was soon narrowed down to CSdCL scenarios involving knowledge sharing systems. Because this Industrial PhD project was being carried out in cooperation with Microsoft Denmark, I searched for schools working with knowledge sharing systems based on Microsoft technology. In collaboration with my colleagues at the time on the Education Team at Microsoft Denmark, I agreed to pursue the new knowledge sharing systems based on Microsoft’s SharePoint server technologies. These new systems were of particular interest to the company. Focusing on CSdCL with a SharePoint based knowledge sharing system, however, narrowed down which education programs I could choose from.

At the time, SharePoint based knowledge sharing systems in education were just entering the market. School programs were either just about to engage in testing a system or they were considering adopting this kind of system. Only one school, Hillerød Business College, had already tested, invested in and engaged with a SharePoint based knowledge sharing system. Just before the beginning of the 2004-2005 school year, I contacted Hillerød Business College’s (HBC) head of quality and communication, who then invited me to become part of the newly constituted e-learning group at HBC. As the school was one of the first to engage in a new platform, he found it interesting to collaborate with a researcher who could follow their activities.

4 The Hillerød Business College, called Hillerød Handelsskole at the time, has been openly identified. Calling the business college HBC signals that any representations of the everyday livings related to HBC must necessarily be partial as they are the result of numerous translation steps. Thus, the idea is not to leave the reader with a sense of ‘just’ knowing (in an innocent sense) everything there is to know about Hillerød Business College. The names of people associated with HBC have been anonymized. Numerous translations have been made, some of which are of a more traditional kind. All the empirical data gathered is in Danish. Unless otherwise indicated, any translations into English are my own, including items on my reference list. The nature of translation necessarily means adding to and subtracting from the meaning during the process of recontextualization.

5 In brief, CSCL involves arranging/researching education using computers to enable/support people’s collaboration/cooperation on assignments/projects from a constructivist perspective on instruction and learning. CSdCL emphasizes that it should be CSCL scenarios that facilitate collaboration/cooperation when not geographically located in the same place.
An introduction

A problematic starting point

Following their activities, however turned out to be a bumpy road. First of all, my initial research design did not easily encompass their activities. Computer supported distributed collaborative learning scenarios involving the Studynet were not easily identified in relationships with the everyday ways of living at HBC at the time. I could engage with this challenge as either an educational problem or as a research problem. I found myself in a situation where most of the activities at HBC I engaged with did not fit my initial problem formulation: How do different CSdCL scenarios facilitate individuals’ learning processes across time and space and at different educational levels?

My initial project description covered an aspect of e-learning where e-learning researchers\(^6\) (including me) believe in the unexploited learning potential of ICT. A large amount of e-learning research results also document learning potential with ICT. However, at the same time, generally speaking, the learning potential remained unexploited and ICT was not getting the revolutionary position in primary and secondary education in Denmark it deserved and that was needed. Danish primary and secondary education was generally depicted as not engaging with the opportunities made available by constructivist e-learning revolutions. Several problems appeared to exist: Why did there appear to be a general mismatch between promises and practices?

\(^6\) This includes all ICT research that focuses on relationships between ICT and education. The orthography of ‘e-learning’ varies, but I have chosen to spell it as ‘e-learning’ to emphasize the relationships between ICTs (the ‘e’) and education (the ‘learning’). The hyphen illustrates that it is a question of relationships, but not what they consist of. I could have called it e-education/education instead, but I choose to stay with a concept that has now become a central actor in the everyday ways of living associated with education in Denmark. In the thesis I use the terminology that the actors I refer to use. For example, if someone uses the acronym for information technology, IT, I also use this. The thesis also uses the concept of information and communication technology (ICT), as this is the concept currently mostly referred to in e-learning research written in English. I refer to ICTs in the plural to emphasize that it is an acronym containing many different technologies. I refer to ICT in order to engage with the subject and sometimes to speak in general about what is usually referred to as digital and computer-based technologies, including telecommunications, the Internet, hardware, software, etc. As will become clear, both acronyms, IT and ICT, are problematic as they assume that what is at stake are matters of information (and communication) and technologies that may form a basis for these matters. Furthermore, as will be discussed, monolithic concepts like IT and ICT take part in making generalizations available while simultaneously eliminating the details and specificities of what issues are at stake. I argue that things and their agencies are distributed and collective matters. As a result, I try not to use phrases that refer to things as if they naturally belong together, e.g. educational everyday living, information and communication technology and the everyday living at the business college. I see all of these as instances of a vocabulary that assumes the connection between things and what actors are central. For instance, educational everyday living refers to some ways of everyday living as being particularly educational, and the everyday living of the business college indicates that some ways of everyday living may be viewed as belonging to the business college. Though perhaps not particularly wrong, it may not be entirely correct either. Phrases like this may be employed when I write about things that are enacted as belonging together, e.g. ICT.
An introduction

What could be done to guide schools into engaging in the so-called e-learning revolution?

These descriptions and problematizations of the then current situation involved a gap between knowledge about some effects of e-learning and the relationships between ICT and education that were generally unfolded. I saw my project as a way of engaging with this gap. In order to bridge this gap, my initial project suggested that more knowledge was needed. I stated in the initial project description that there was a general lack of knowledge about the learning potential of new ICTs, for example, knowledge sharing systems, in relation to secondary schools. There was a growing consensus (e.g. Mathiasen, 2003) that in (primary and secondary) schools, mostly ICT – and more specifically knowledge sharing systems – were engaged as administrative tools for organizing education. However, there seemed to be a general lack of putting it into practice when it came to realizing ICTs as tools/media for learning. My project proposed that research on CSdCL scenarios could help fill this gap. In this sense, I imagined that constructing new forms of contexts and researching the learning potential to be gained from them would provide some of the knowledge and relationships needed to bridge the gap.

As the project was then concerned with the pedagogical (and not organizational/administrative) aspects of ICT use, it seemed natural to begin with a focus on student learning. Several problems appeared, however, in relation to my research design and problem formulation. First, I had to locate CSdCL scenarios. I was uncertain as to how they looked. I could either turn to the literature or to practice. In practice, nothing called CSdCL scenarios were to be found (other than in my project description) at HBC. I found it difficult to figure out ways to identify so-called CSdCL scenarios in the everyday ways of living at HBC. They had to involve student learning and the Studynet, as well as matters of distributed collaborative learning. Also, I was looking for cases that would represent variations of CSdCL scenarios (whatever that meant). The premise (often the case in e-learning research) was a new ICT (the Studynet) and new forms of teaching and learning (CSdCL), which is why the research design included looking for, identifying, and researching scenarios, in addition to participating in the development of scenarios, which seemed like a necessity as finding CSdCL scenarios involving the Studynet was difficult. Developing scenarios, however, also positioned CSdCL scenarios as a supposedly natural and needed ingredient in the everyday ways of living associated with HBC. In this sense, the mismatch between my search for CSdCL scenarios and the everyday ways of living at HBC occurred as an educational problem. During my first visits to HBC I spent most of my time engaging in activities apparently not relevant to my research. Consequently, I began wondering
whether my starting point rather than HBC’s starting point was problematic. This led me to rephrase my problem formulation.

What may once have looked like a logical approach, today – in retrospect – seems problematic. In pursuit of this particular construction, I found myself continuously wondering about what seemed to matter in practice but was not covered equally by my research. Instead, most of the everyday activities involving, in some way or another, the Studynet were determined not to be central to my research because they were often related to the organization and administration of everyday ways of living at HBC. Although numerous activities included the Studynet, they became of lesser value inside my research design. The focal point of my attention was one particular construction: Student distributed collaborative learning with the Studynet.

During the 2004-2005 school year, it became increasingly clearer to me that I could pursue what appeared to be an apparent lack of practices relevant to my research by taking part in inventing relationships and making them happen in order to investigate them; or I could pursue what was problematic and try to engage with the matters and constructions of relationships that seemed to matter to the actors in the everyday ways of living associated with HBC and the Studynet. The former approach would position HBC as a place that needed particular innovations (construction work) to be developed in order to fit my research aims, while the other approach would position HBC and its relationships with the Studynet as particular innovations (construction work) to be researched. The first approach would engage with a particular (theory-based) realization of things, while the other approach would study realizations of things (including my own constructions). In 2004-2005, I tried to grapple with this issue, which at the time was not as clearly defined by me as I hope that it is now. I was only beginning to sense the possible difference between these two approaches, and why choosing the second approach would become essential.

Being sensitive towards the everyday ways of living

After a few visits to HBC I decided to shift my attention from being sensitive towards CSdCL scenarios to being sensitive towards the everyday ways of living associated with

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7 Though not in the sense that it was or cannot be useful. This once apparently logical approach played a part in the steps that led me to write this thesis. Today, however, I find that the rationales put forward in the project description in 2004 represent particular variations of enactments of relationships between ICT’s and education that have been a common feature in – the (Danish) research ‘field’ of e-learning. Rather than taking these as the/my point of departure in this thesis, they are now included as a possible point of departure for understanding and engaging with things. This point of departure might be particularly appropriate when wishing to develop or research things that develop in a particular direction, but perhaps cannot be viewed as useful when wishing to investigate the variation of ways in which things move and become moved.
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the Studynet and its mergings with different constitutive entanglements associated with HBC. This meant that instead of trying to categorize things as matters that were or were not associated with CSdCL scenarios, or as either pedagogical or organizational matters, I started engaging in learning to be sensitive (Latour, 2004) towards the different kinds of connections made involving the Studynet. This meant noticing how the Studynet became a part of the everyday ways of living\(^8\) associated with HBC. Initially, I was interested in how CSdCL scenarios (involving the Studynet) could facilitate student learning processes. This meant engagement in particular connections always involving students, the Studynet, learning and instruction/teaching. The new approach meant including situations without students, instruction/teaching and even without the Studynet. And it also meant not necessarily engaging with matters as if they were either organizational/administrative or pedagogical matters.

Researching the Studynet as an actor

Part of my problem was that I found numerous activities involving the Studynet in some way or other, but not necessarily a plentiful amount of teaching activities involving the Studynet as the central means or platform\(^9\) for teaching and learning, and therefore not an abundant amount of connections between student learning and the Studynet. This, however, did not disqualify the Studynet as an important actor in the everyday ways of living associated with HBC. Through my engagements with HBC, I was struck by the fact that so many changes seemed to continuously involve HBC’s actors. The Studynet seemed to be, in a sense, a change agent. At the same time, the Studynet did not necessarily occupy the same position in the everyday ways of living associated with the students’ lives as it did in, e.g. teacher and leaders’ engagements. In addition, it was not

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\(^8\) Everyday ways of living is an intentionally weak expression I use to encompass assemblages of day-to-day activities, yet it does not imply that they are necessarily assemblaged sequentially through day-to-day construction work and activities. It is supposed to be a relational concept that does not imply what generally constitutes or does not constitute everyday ways of living. It is also meant as a simple reference to the connectedness of the living world in what we commonly refer to as our everyday lives or day to day activities. I wish to emphasize that I am not concerned with particular human ways of life and that I take everyday ways of living to be performed/done multiply. Everyday ways of living can take on many coexisting forms, the agencies of which may vary (e.g. appearing as partially exotic, mundane, common, routine, and plain). I refer to everyday ways of living as an expression that should not assume the actors and qualities of actors that constitute the assemblages of ways of living. It does assume however, that more than one actor, form of existence and living are involved. Everyday is not supposed to imply which moments matter nor what a moment/timing may be defined as. Everyday ways of living illustrates that this research gathers particular associations of relevance to (in this case) the activities of programs at Hillerød Business College assemblaged in particular times and spaces that exist interobjectively.

\(^9\) This thesis does not present a general discussion of what knowledge sharing systems are. The thing which is referred to as a knowledge sharing system that has become a central – though not the central actor – in this research and thesis is referred to as the Studynet. Instead of specifically defining the Studynet and knowledge sharing systems in general, the agencies of the Studynet become enacted via the many different relationally defined articulations and propositions that appear throughout the thesis. Its different manifestations can be found partially represented in and distributed across conversations, teachings, literature, interviews, meetings, teaching preparations, policy papers, research, education, etc.
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the only actor taking part in moving the everyday ways of living associated with HBC. Being able to understand the Studynet as an actor and an educational change agent – though not taking its agencies (where, in which relationships, to whom and if it would matter) for granted – and not necessarily focusing on student learning through teaching activities with the Studynet seemed to be an interesting and possibly (in relation to e-learning research) new opening for inquiries into the everyday ways of living with ICTs in education. If the Studynet could perhaps be both a central actor in the everyday ways of living at HBC, and still not necessarily be the central actor, e.g. in student learning, then it might explain some issues concerning the apparent gaps between ICT integration, the expected e-learning potential and realized practices.

Pursuing (dis-)engagements, (dis-)connections and movements

In order to pursue the ways in which the Studynet became part of the everyday ways of living associated with HBC, I also realized that it was important to include the ways in which the Studynet did not become part of the everyday ways of living at HBC. This led me to pursue different forms of (dis-)engagements and (dis-)connections associated with the Studynet. Furthermore, while my initial research proposition focused on a particular form of change – called learning – which seemed to limit the connections between the Studynet, HBC and its actors, I became interested in variations of what I call movements. Using the term movements is an attempt to engage in an approach which neither takes for granted what changes contain, nor how they are being contained, i.e. neither the direction, the point of departure, nor the endpoint of things. But, the term does focus on things as both moving and being moved.

E-learning as effects

In this thesis, I do not particularly engage in the kinds of movements called learning, and I do not claim to include all forms of movements associated with HBC and the Studynet. I do try, however, to engage in researching relationships between ICTs (in this case the Studynet) and the everyday ways of living associated with education (in this case the upper secondary education programs at HBC). This thesis represents a kind of decentering of ICT, teaching and learning as a priori the central actors in e-learning research. This may seem like a paradoxical approach to research that claims to be about e-learning. Note that my definition of what I call e-learning research includes all research with a focus on relationships between ICTs and education. This research, however, attempts to contribute with what I believe to be a new approach that studies e-learning as effects rather than as things with effects. Therefore, this thesis centers not on learning potential, but on a variety of issues that occupy little if any space in much
Danish e-learning research, which is the area of focus. Thus, the spotlight is on things that are mostly considered simply the stuff that surrounds what really matters.

I claim that this shift – this movement – in where the spotlight is focused is one which might bring to the fore new concerns, but it is important to remember that it simultaneously disconnects with other concerns (e.g. this research does not focus on learning, pedagogy and didactics – yet it still covers central matters of concern for educational research and education programs). As such, this thesis and research – as any other – moves things in particular ways. As Strathern writes, “Interpretation must be a matter of refusing many meanings in order to focus on any” (2004, p. xvii, Preface).

From innovation to handling movements with ICTs

Engagements with ICTs in education in constructivist practices (Orlando, 2009) have become the benchmark of effective and innovative practices. This thesis represents a move from factors influencing the innovative use of ICT to which processes of associations matter for engagements with ICTs. Drent and Meelissen (2008) note that most studies emphasize the success of using ICT, while their study emphasizes the success of innovative ICT use. Orlando (2009) criticizes studies that emphasize changes of a particular kind. When focusing on constructivist practices, Orlando argues that the non-constructivist impacts of ICT become excluded. Furthermore, Orlando claims that often studies of changes in teacher ICT practices are technocentric in the sense that they emphasize ICT as the determining factor. Orlando argues that quite possibly different forms of change as well as the complexity of what constitutes changes have been overlooked. In keeping with this point, Friesen (2008, 2008a & 2008b) also criticizes e-learning research and what he calls the three myths of e-learning (bound up with the knowledge economy, promises of anywhere, anytime, anyone learning, and technology as change agent). This thesis can be viewed as a contribution to research that moves e-learning research from a focus on particular constructivist oriented ICT-mediated/-supported activities to engagements in understanding what mediates relationships between ICTs and education.

I hope that the contributions of this research to the academic world of e-learning and (hopefully also) to education programs and companies engaged in issues concerning e-learning can raise awareness and encourage thinking and engaging differently in enactments of relationships between ICTs and education. Rather than thinking in terms of a particular kind of movement (e.g. learning or moving from old to new schools), this thesis illustrates that many different kinds of movements can coexist, emerge and (dis-) engage everyday ways of living with ICTs. This raises a different issue compared to the one dealing with the mismatch between expected revolutions and apparent stagnation in
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education programs. Instead, the concern becomes: If neither what partially contains nor what is partially contained is given, and we cannot easily tell what may/can/ought to be the point of departure, the road, or the end station of things, then how can we possibly handle movements associated with ICTs in everyday ways of living in education?

An STS and ANT inspired approach

In order to complete the shift from CSdCL scenarios to researching movements in the everyday ways of living associated with HBC and the Studynet, I needed to move from a learning philosophy and pedagogy centered approach, to an approach that would be able to include any kind of movement. For almost two and a half years I struggled to figure out a way to disengage with a learning philosophical approach as my theoretical point of departure (centering learning) in order to engage with an approach that would simultaneously be able to include potential learning philosophical and pedagogical approaches in its assemblages. This meant remaining open to the possibility that particular learning philosophical and pedagogical constructions can take part in matters of e-learning without necessarily being bound by them in my own research. I wished to engage in an approach that could include my own constructions and the ‘other’ constructions in the living world without falling into the trap of necessarily constructing a divide between research and researched – subject and object. My initial trouble began with the problem of not being able to make these distinctions. CSdCL and what became the objects/subjects included in my research coemerged and coexisted. And far more importantly, particular disconnections of a variety of objects/subjects clearly mattering to the everyday ways of living at HBC were included in these movements.

Inspired (especially) by science and technology studies researcher (STS) and social anthropologist Marilyn Strathern (2004), actor-network-theorist (ANT) and empirical philosopher Bruno Latour (2005), the research moved from a focus on studying and developing CSdCL scenarios to researching movements in representations (enactments) of relationships between ICTs and education. This is the underlying connecting thread of the entire thesis. It coexists and coemerges with the empirical studies and my engagements with various actors in the 2004-2005 and 2005-2006 school years. The focus of the thesis is how does a knowledge sharing system – called the Studynet – become part of and take part in moving the everyday ways of living associated with the secondary school programs at a Danish business college? However, as a connecting thread throughout the thesis, the reader will find coemerging and coexisting issues relating to researching movements in the representations (enactments) of relationships between ICTs and education.
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Pursuing specificities in enactments of relationships

This thesis and each chapter unfold this research and these issues in particular ways. Since accounting for every move involved in the research would simply not be possible and since such a quest would quite possibly make this thesis unreadable and never-ending, I make as many specificities as possible explicit while simultaneously trying to avoid spoiling the argumentation. Different assemblages could have been made, making other specificities available to the reader. It is important to keep in mind that throughout the text, I am engaged in a research approach aimed at movements. In this thesis they come in the form of variations of representations (enactments) of relationships between the Studynet, HBC and the different nets of actors working with and associated with them.

While reading this thesis, it is important to keep in mind that I have several goals concerning how the text is structured. First, I notably do not see this text as presenting one opening – one entrance – to this issue. In a sense, it may of course be read this way. But each chapter, and sometimes a group of chapters, may constitute different introductions. In addition, the issues treated are not fully represented in one place in the thesis. I do not define concepts, but attempt to move around things through their appearances in different relationships. My aim is for my style of writing to show that the problem is not representations (knowledge) in the mimemic sense, but representations in the form of articulations of propositions (Latour, 2004), i.e. relationships. Knowledge is the partial result of relationships and matters differently inside variations of relationships. Therefore, as Strathern argues (2005), knowledge is not a safe path to action. What matters are relationships, and knowledge may be considered a part of the constitutive entanglements of relationships and vice versa. But knowledge does not necessarily ensure that a particular relationship occurs. Relationships make knowledge and not the other way around. Inspired particularly by Latour and Strathern, I attempt with this thesis to shift attention away from knowledge about the effects of e-learning to researching relationships that make up e-learning – that is relationships between ICTs and education – as effects.

Empirical-methodological-theoretical gatherings

I encourage the reader to engage in reading this text as an interesting journey, one that emerges as in-between movements that require significant work and attention – also on the reader’s part. Reading the text in a particular way, things could have been categorized differently and, for instance, introduced better by, e.g. describing the context of this research in one way in one place, introducing HBC and the Studynet in one way in one place, as well as the theory and methods in one place and one way, etc.
But, I hope to show that I have good reasons for not choosing these forms of articulation. It has to do with the ways in which I became engaged with things in the course of my research. I wish to illustrate throughout the text that many movements (un-)folded, while many coexisting and coemerging contexts of knowledges and engagements collapsed, evolved and partially existed. Things did not stay the same, including this research, the literature in this thesis, HBC, the Studynet and the human actors and events that become part of the research. Many things moved this research, and this research moved many things. And movements are not necessarily singular, progressive, consecutive, regionally contained and/or transitive. I hope to illustrate this empirically, methodologically and theoretically throughout the thesis. I do it in one fell swoop, because in reality the empirical, methodological and theoretical assemblages made throughout this research were more empirical-methodological-theoretical than separate aspects of research to be moved between in neatly organized ways. This thesis may seem to jump between concrete and abstract language and articulations. However, I wish to engage the reader in not being too certain about what is concrete and what is abstract as well as what lies in the difference.

I hope the hard work required to apply the various ways of unfolding shows through and that the style I have used will not be misinterpreted as a lack of commitment to make reading the text a more pleasant ride for the reader. I consider every aspect of the thesis as equally theoretical, empirical and methodological. Because my research (subjects and objects) can – in my opinion – be best described as perpetually mobile, then the resources engaged in the descriptions must necessarily also vary. Moving the contexts of knowledges and engagements also involves moving what the research contains and the ways in which it becomes contained. In each empirical-methodological-theoretical snapshot, there are numerous, but not an unlimited amount of, possible (dis-)connections. These can only partially be included. Many more could have been articulated. I focus mainly on what I have included (which is what is to be found in the text). I do not try to put empirical–methodological-theoretical snapshots in their (right) contexts. For instance, when associating to Latour’s writings, I do not try to put a metaframe – a sort of context – around Latour in order to really frame him. I consider his appearances in this thesis, just as I consider any other actor’s, as partially constituting Latour inside the assemblages made in this research, and thus consequently also partially framing Latour. My main discussion partners in this thesis are (Danish) e-learning researchers. Of course these discussions also fold e-learning research and e-learning researchers in particular ways that at times appear to over generalize and thus simplify (Danish) e-learning research and e-learning researchers. I try not to give the impression that the particularities of this research simply apply to every other situation. Moving between particular constructions and generalizations and vice versa is a central topic of this thesis. Generally, I attempt to engage in relational, processual and
performative conceptualizations. Whether they appear in the disguise of a specificity or a generality, or a concrete or an abstract entity, I encourage the reader to think of the thesis as a particular gathering – a proposition – an articulation – a representation – an enactment – a partially existing opening and closing consisting of many partially existing openings and closings. Other entanglements could have been and would have been relevant to (dis-)engage.  

Each (dis-)engagement, apart from adding reality to the claims made in this thesis, subtracts from the realities partially represented within this research.

Overview of the thesis

Connecting: Relationships between ICTs and education
The imaginary of ICTs as revolutionary change agents is tightly connected with so-called matters of e-learning. In this chapter I will begin to position e-learning and knowledge sharing systems and what stands ‘around’ these concepts and their variations of enactments as sources of change in education.

Chapter 1 and 2 combined with Vignette 1 and 2 should be read as another way of introducing this research, HBC and the Studynet, and of introducing how I make it work empirically, theoretically and methodologically.

Chapter 1: Movements: Math, Interobjectivities and In-between Agentizations
This chapter takes the reader to a commercial upper secondary program (HHX) math teacher’s descriptions of the ways in which the Studynet and other ICTs become part of his math teaching activities. With an outset in an interview with the teacher, this chapter illustrates how the Studynet is mobilized as a partially relevant and (dis-)engaging actor through processes of making it partially compatible with the shifting instruments (i.e. paper and Mathcad) and with the specificities ‘of’ math teaching (e.g. computer access and working with parabolas). These shifting specificities involve moving both what transports math and what the practicalities of being engaged with and handling math mean.

The chapter suggests that variations of the relevance of, (dis-)engagements with, and partial (dis-)connections to and from the Studynet exist inside the moving specificities

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10 For example, I could have included a different focus on variations of STS and ANT research, e.g. by including the science wars, the different enactments of STS approaches, the different enactments of variations of ANT positions, the different enactments of variations of e-learning research, the different focus on my own (dis-)engagements during the processes of researching and writing this thesis, the different focus on contextualizing what a knowledge sharing system is enacted as in variations of literature, e.g. information system design research, the differing focus on human and non-human actors, e.g. the different emphasis on students, administration employees, the business academy education programs, youth education programs, teaching subjects, etc.
of the integration of the Studynet into the everyday ways of living associated with HBC. This may be a methodological key to understanding the ways in which the Studynet becomes part of and takes part in moving the everyday ways of living related to the business college. The chapter illustrates circumstances under which the Studynet becomes partially disconnected from the math activities.

**Chapter 2: Movements: Working Platforms or Platformations at Work?**
This chapter takes the reader to different articulations of what the Studynet is. While the math example situated the Studynet as an actor with quite limited opportunities for participation, the overall introductions to the Studynet at HBC present the Studynet as a central actor – the new platform of activities.

To begin with, the imagined ideal of the Studynet as *the* platform for things takes part in the fabrication of the evolving activities and engagements with the Studynet at HBC. This comes to expression, for example, in attempts to control teacher and student use of the Studynet, for instance, by closing down student access to Hotmail during the school day and by disconnecting teachers’ homepages.

The chapter discusses these movements as ways of partially (uni-)directing, generalizing and foundationalizing engagements with the Studynet. This approach is presented as problematic because it ignores the moving specificities involved in making the Studynet compatible with the variations of everyday ways of living relating to HBC.

In relation to the math example presented in Chapter 1, Chapter 2 proposes a move from a focus on the Studynet as an autonomous object – a platform – with qualities entering practices into the Studynet as emerging practices – as partially existing platformations. It is argued that variations of points of departure for engagements in the Studynet move the positionings of the Studynet in multiple directions. Thus, inside the moving specificities of ICT integration, variations of directions for engagements with the Studynet and partial (dis-)engagements and (dis-)connections with them coexist. The chapter also shows that this may be another methodological key to understanding the ways in which the Studynet becomes part of and takes part in moving the everyday ways of living related to HBC.

**Vignette 1: A Science ‘of’ Movements: Neither Grounded Nor Groundless**
This vignette presents some of the STS and ANT resources that this thesis and the first two chapters relate to. Thus, in a sense, it invites the reader to reengage in the first two chapters. My approach draws on several especially ANT-focused resources that I assemble into what I would like to call a moving approach – or a science of movements. An approach which acknowledges that science is on the move, that science moves the
things it engages with, and that this is a science that takes the uncertainty of the nature of things and their constitutive entanglements seriously and thus does not a priori abandon particular ways of assembling things. It is a science that is neither grounded to begin with nor groundless, but rather interrelationally grounded. It is a science that considers any gathering of things a particular momentary movement.

Vignette 2: Beware, Things Are Gathered!?
The second vignette works two-fold. It presents this research as consisting of several workings that are related to both the effort put into doing this research and the daily efforts at HBC that are put into making the Studynet work. In this sense, the Studynet becomes entangled in variations of interrelationships and workings. De Laet and Mol’s (2000) descriptive and practical ways of framing technologies are presented as a point of reference for my ways of shifting methodologically, concretely and theoretically between – moving – contexts of knowledges and engagements. The reader is invited to revisit chapters 1 and 2 again in order to discuss the method of assembling found here. The focus is on understanding movements as passages between specificities. Movements are therefore also presented as specificities, i.e. as environments within things.

Chapter 3: (Re-)Configurations
Chapter 3 presents, for example, a basic vocational program (HG) teacher and a commercial upper secondary program (HHX) teacher’s descriptions of their efforts to engage with the Studynet as actors in their teaching activities. Both teachers had been conscientiously working towards making the Studynet compatible with their everyday teaching activities as the platform for things. They both focused on handling assignments using the so-called “Assignment” and “Delivering Assignments” functionalities on the Studynet. Furthermore, they engaged in moving their previous homepage engagements and activities to the Studynet.

This chapter employs the interviews with the two teachers in a discussion of remediation, a concept introduced by Bolter and Grusin, and illustrates how Bolter and Grusin’s concept of remediation – often referred to in e-learning research – may in fact be misleading (if taken as a general point of departure for explaining things) as it too easily leads to the assumption that engagements with ICTs are either about doing something new, better and more effective (shifting out) or are a simple matter of remediation (association), i.e. old wine in new bottles without great costs.

Interviews with another HHX teacher and conversations with the head of HG illustrate that the Studynet is not just another way of doing the same work, i.e. handling assignments by other means; it is not just another better, easier and more effective way
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either. What is new and what is old continuously move and coexist partially inside the specificities of the merger of the Studynet and everyday ways of handling assignments in HG.

Chapter 3 suggests that engaging with a relational and complex concept of movements in everyday ways of living that does not assume to begin with the relationships of things and their space-timings (e.g. what is old and what is new) is another methodological key to researching the Studynet as actor in the everyday ways of living associated with HBC.

Chapter 4: Making ‘It’ Work and Reworking ‘It’
This chapter further explores how the Studynet becomes part of and takes part in moving the everyday ways of living at the business college. Based on an introduction seminar arranged by HBC’s e-learning coordinator, and a conversation between the head of communication, the e-learning coordinator and me, this chapter illustrates how the Studynet is partially mobilized as a very different actor in multiple coexisting realities relating to HBC. While Chapter 2 illustrates the enactment of particular unidirectional strategies for engaging with the Studynet, Chapter 1 illustrates a situation inside which the Studynet became partially disconnected, and Chapter 3 illustrates situations inside which the Studynet was enacted as a partially (dis-)connecting change agent through full (dis-)engagement approaches. Chapter 4 illustrates how engagements with the Studynet in heterogeneously assembled everyday ways of living involve several emerging partially existing and engaging practices and strategies. This chapter illustrates that both the business college and the Studynet are being partially and multidirectionally (re)formed in relation to the ongoing emerging engagements with the Studynet.

Chapter 4 presents the Studynet as always partially connected with, partially existing and partially situated at HBC, which calls for engagements that take partially existing translations and partial connections – without stating the nature of them – as a point of departure for things. This may be another methodological key to understanding the ways in which a knowledge sharing system like the Studynet becomes part of and takes part in moving everyday ways of living in education.

Acknowledging this, it follows that we may also need to pay closer attention to the enactments of alternatives when wishing to engage in understanding the ways in which ICTs like the Studynet become part of and take part in moving everyday ways of living associated with education. A central point in relation to this is that the enactments of alternatives also move with things. Thus, the grounds against which things become evaluated do not stay the same.
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The conclusion in this chapter proposes another way of opening the issue of understanding the ways in which a knowledge sharing system becomes part of and takes part in moving the everyday ways of living associated with the basic vocational and commercial upper secondary programs associated with a Danish business college. This chapter proposes that rather than thinking in terms of the integration (assembling parts in a whole)/implementation (execution)/diffusion (spreading) of the Studynet as a process with a well defined beginning and end – consisting of consecutive (and teleological) phases/steps of introduction, getting used to, and gradually establishing and stabilizing (particular planned for) educational practices with the Studynet to move on from at HBC – the movements involved in engaging with the Studynet are better described as perpetually mobile, ontologically multiple and coexisting processes of mobilizing (in-)compatibilities between the Studynet and the everyday ways of living associated with HBC.

Thus, as illustrated in-between chapters 1, 2 and 3, Chapter 4 further illustrates the suggestion that moving the contexts of knowledges and engagements may be another methodological key to understanding the ways in which the Studynet takes part in and becomes part of moving the everyday ways of living relating to HBC.

Chapter 5: Movements and standing still?!
In Chapter 5 I engage in a discussion of some of the coexisting and coevolving movements and understandings of movements that I see partially represented at HBC and partially represented in Danish e-learning research literature. This chapter concludes by stating that another methodological key to understanding the ways in which ICTs take part and become part of moving everyday ways of living may be to engage in understanding shifting movements and variations within.

This chapter revisits the point about the space-timings of things and research as mattering. Using Strathern’s (1996) arguments about the coexistence of imaginaries of the new and the old – innovation and tradition – this chapter discusses how e-learning research in Denmark has also had a tendency to depict movements with ICTs as a matter of progression from one thing/place to another. Using examples from and references to HBC, this chapter advances the idea of many coexisting movements and variations within that continuously emerge in the everyday ways of living at HBC.

Chapter 6: Shifting ontologies
Chapter 6 introduces more examples of various ways to engage the Studynet in everyday communication and the course, assignment and project work associated with HG and HHX. This chapter presents some of the activities that are enacted at HBC that are not overly concerned with making particular functionalities work ‘as promised’ (e.g.
An introduction

when it says it is a Discussion functionality it must be generally able to handle discussions). Instead, the activities included here are marked by partially engaging the Studynet in ways that primarily make sense in relation to variations of everyday living. Instead of focusing on general labels, functions, and full engagements, these activities approach the Studynet as a possible partial association, and this takes part in enacting different spaces for activities to unfold.

Chapter 6 illustrates how shifting space-timings for engagements with the Studynet as well as engagements in ways to handle communication and assignments produce different boundaries for what handling discussions and assignments with the Studynet is comprised of, what these matters partially contain as well as how they are partially contained by everyday ways of living at HBC.

Conclusions
This chapter presents a summation of the central points of the empirical-methodological-theoretical gatherings made throughout the thesis.
CONNECTING

RELATIONSHIPS BETWEEN ICTs AND EDUCATION

“… computers in classrooms have been oversold by promoters and policymakers and underused by teachers and students.”

(Cuban, 2001, p. 195)

“Despite the efforts made in the field of training and in the equipping of [Italian] schools, to date the results at the school level are still relatively limited. There is not a wide integration of ICT use as tools to enhance teaching and learning in curricular topics.”

(Bottino, 2003, p. 2)

“… innovation in education based on ICT is in its infancy in most of the leading countries [the Netherlands, Canada, the USA, England, Finland, Denmark, Singapore] … With the exception of Singapore, there are hardly any differences between the countries with regard to the way ICT is used at present: Teachers use ICT mainly in support of lessons and for searching for information; pupils use computers mainly for exercises, searching for information and writing texts. Education has changed little due to ICT. The use of ICT seems mainly to have replaced and supplemented existing education…”

(Oudejans et al. 2003, p. 45)

“Overall, the use of computers in Norwegian schools in 2003 is limited. Only few applications and services are being used. Internet search and word processing are used the most.”

(Kløvstad & Kristiansen, 2004, p. 2)

“… IT is on its way to becoming an integral part of the pedagogical practice [in Denmark] … But there is a wide variation from school to school and from teacher to teacher.”

(Danish Evaluation Institute, 2005, p. 5)

“Results from E-learning Nordic 2006 show that ICT generally has a positive impact on the teaching and learning situation. However, some people expected that ICT could in some ways revolutionize the teaching and learning processes at school, and compared with this view, the impact must be seen as more limited.”

(Ramboll Management, 2006, p. 9)

“If you were to visit us today, you wouldn’t be able to tell the difference. Nothing has changed.”

(Head of quality and communication at HBC, 2008)

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11 Telephone conversation with the head of quality and communication at Hillerød Business College (HBC) on February 25, 2008 – approximately one and a half years after concluding my research at HBC.
This chapter begins with a collection of quotes that represent a variety of ways of stating one paradoxical issue: In spite of the continuous introduction of numerous new ICTs in education in the Euro-American world, radical revolutions appear to have generally not been occurring in education. This imaginary of an apparent lack of revolution and the imaginary of ICTs as revolutionary change agents are discussed and examined throughout this thesis. The imaginary of ICTs as revolutionary change agents is tightly connected with so-called matters of e-learning. In this chapter I will begin to position e-learning and knowledge sharing systems and what stands ‘around’ these concepts and their variations of enactments as sources of change in education. This chapter is entitled Connecting because it should be read as a collection of different representations that do not quite hang together and yet take part in various ways in making the constitutive entanglements of what matters and how things matter and become related in enactments on relationships between ICT and education in Denmark. Any research places itself in the midst of things. I use this chapter as one way to engage in the description of some of these things. It can also be read as a way to illustrate what may be some of the contributions to the ways understandings of e-learning are approached, and thus also to the movements of e-learning as matters dealt with and to be researched that are the result of this research.

According to the Danish Ministry of Science, Technology and Innovation (2003, p. 22), Denmark could still be described in 2003 as being in its early phase in relation to e-learning. Whether Denmark is in an early phase or not depends on which literature we turn to. In 2000, Bent B. Andresen wrote that e-learning was a somewhat new concept originating as a kind of super concept emphasizing, “time- and place flexible learning where collaboration and supervision takes place in a virtual learning space or in a combination of a physical and virtual learning space” (Andresen, 2000, p. 5).

Andresen’s definition emphasizes that e-learning refers to a special kind of learning that is time and place flexible and is either based on so-called virtual, i.e. is ICT-based, learning spaces or a mix of so-called traditional physical and new virtual learning spaces. According to Andresen the concept in English can be dated to approximately 1998, and must be understood in relation to the distribution of World Wide Web, and – in relation to this – the subsequent explosive use of e-mail and e-business.

In a 2003 speech entitled “Is e-learning going mainstream?”, Vivian Reding, a member of the European Commission and responsible for education and culture, stated that:

“... we are no longer asking the question “can ICT, the Internet and e-learning help us to improve the quality of education and training?” – this having been
demonstrated through countless examples. Instead we are asking “how and when may we best use e-learning in our schools, in our universities, in our training colleges, in the work place …?” Our attention is moving from the technology and the infrastructure, towards the practice, the pedagogy, the content … We are now concerned with issues of: Context, effectiveness, efficiency, standards and quality. And we are examining the wider implications for curricula, for training and technical support, and for organizational change within the educational establishments. All this at a time when our education and training systems are going through a period of fundamental change, as we move inextricably towards the knowledge society. A society of lifelong learning and education for all.”

(Reding, 2003)

Reding emphasizes a move from can ICT to how and when can e-learning improve the quality of education and training. Reding’s speech represents an interesting move from an uncertain to a more certain approach to engagements with e-learning. It also evokes a focus on the positive aspects of ICT-integration in education. Furthermore, Reding anticipates that attention directed at technology and infrastructure is no longer needed. Reding also describes ‘our time’ as a time when ‘our education and training systems’ move inextricably towards the knowledge society. Robin Mason, who worked with, among others, Open University, proposed in a 2004 speech entitled “What have we learned from 20 years of e-learning?” that we have now moved into the mainstreaming of e-learning – meaning everybody engages in e-learning. Mason explained that we are living in the Digital Era, and she said that, “The Internet has changed the whole nature of what it means to learn.”

Mason explained that she believed that the whole society is being shaped by the internet. To Mason the rationale for engaging in e-learning must thus be “to prepare students for the world that is out there” (ibid.). Furthermore, she emphasized that at the core of what e-learning offers lies the possibilities of putting the student at the center. In line with this, e-learning to Mason was a matter of a cultural shift in education. The most interesting point of all related to e-learning was according to Mason that “it is a transformational technology” (ibid.). To Mason the mainstreaming of e-learning implies that the e in e-learning can be viewed as a convenience that will not be necessary much longer, as basically we are dealing with learning.

Neither Reding nor Mason makes clear what they actually mean by mainstreaming. But I take it to refer basically to the fact that today e-learning both as a word and as a reference involving multiple practices has become a more or less taken-for-granted and

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12 “Want to study in your own time, in your own home or workplace? Then the Open University is for you. It is the UK’s biggest provider of distance learning.” Open University homepage: http://www.open.ac.uk/new/introducing-ou.shtml, accessed on July 29, 2009.

13 Source: digital recording of the speech held at the annual Danish education conference called Uddannelsesforum in 2004.
naturalized element of the living world (at least in relation to the Euro-American part of the world). In Denmark this is partially represented by the recent launch of the National Strategy for ICT-supported Learning (National IT and Telecom Agency, 2007) – also being referred to as the National E-Learning Strategy. Also the current Danish Minister of Education, Bertel Haarder (2006), emphasizes that in Denmark ICT must be integrated in all subjects of teaching, at all levels – where it is natural. The Danish Ministry of Education has for many years emphasized ICT integration where it is relevant. This small change in words may indicate that ICTs are becoming more taken for granted as being relevant actors in education. Whereas the emphasis on relevance implied a critical approach, taking ICT to be a natural matter makes it a little less questionable and furthermore, naturalization of ICTs also inserts the notion that ICT integration does not require a lot of work – ICTs are being integrated where it is simply natural.

Mason and Reding’s use of the word mainstreaming about e-learning brings several connotations to mind. First of all, it implies that e-learning is something we can/should talk about in general terms. Second, that e-learning represents some kind of main current of thought and behavior, which involves widely accepted values, actions, practices and ideas. Third, it involves the imaginary that e-learning is no longer exceptional, extreme, exotic or different. Fourth, it seems easy to relate it to the imaginary that e-learning has become a natural way of teaching and learning that everyone everywhere ought to engage with.

However, one only needs to search the Internet for concepts like e-learning, net-based learning, ICT-supported learning, and virtual learning environments to become aware of the fact that even though the word e-learning may have become widespread (Heilesen & Bækkelund Jensen, 2003; Bang, 2003) it hardly covers one specific way of thinking about and enacting relationships between education, learning and ICTs (Heilesen, 2001).

While Andresen dates the word e-learning back to 1998, various approaches using words like net-based and distance education can be traced much further back (Bang, 2003). Distance education and so-called computer-mediated instructional activities may have a very long history, but it is especially since the 1990s with the spread of more affordable computers and the Internet that variations of so-called computer-mediated education exploded (ibid.). Thus, the coining of the overall term e-learning and its widespread use may be viewed as a partial result of countless workings among

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14 106,000,000 hits on Google and 270,000,000 on Live Search (April 7, 2009).
15 For example, education via the conventional postal system.
other connected with the domestication\textsuperscript{16} of both computers and Internet combined with the establishment of an increasingly widespread acceptance of the value of ICTs as a means for learning, education and instruction.

One expression of this development in Denmark is represented in Lars Birch Andreasen’s PhD thesis (2003a) on collaboration in virtual learning environments in relation to university education. Birch Andreasen’s research is based on empirical studies from 1998 with a focus on what he calls \textit{everyday implementations} of virtual learning environments in universities (ibid., p. 10). He refers to three generations of distance education in which the third generation (1980s and on) marks a time when the term – he argues – \textit{distance education} seems less adequate, as it becomes less about net-based education at a distance, and more about net-supported education, where the aspect of computer-mediation is understood as “\textit{one among many ways of organizing}” (ibid., p. 27) education.

According to Christian Dalsgaard (2008) and Karin Levinsen (2005), the period in which Denmark seriously began engaging with the integration of ICTs in the educational system is connected with the so-called Dybkjær-Christensen report \textit{The Information Society in 2000 (Informationssamfundet år 2000)} (Dybkjær & Christensen, 1994) and the Danish government’s subsequent IT action plan \textit{From Vision to Action: The Information Society in 2000 (Fra vision til handling – Informationssamfundet år 2000)} (Ministry of Science, 1995). Another indication of the focus on ICT in relation to Danish education is represented by the Danish National Centre for Technology-Supported Education (\textit{Center for Teknologistøttet Undervisning}), which was founded in 1994-1995.

In 1997 the Danish Ministry of Education asked Sigmund Lieberg from the Norwegian Learning Material Center and Jeff Morgan from the British National Council of Educational Technology to undertake an evaluation of IT in the Danish School System.\textsuperscript{17} Part of the authors’ conclusions was that there was a lack of empirical material about teachers and students’ actual use of ICT in the classroom. According to the Danish Ministry of Education’s (1998) new action plan covering 1998-2003, \textit{Information and Communication Technology in the Educational System (Informations- og kommunikationsteknologi i uddannelsessystemet)}, the Danish government decided on a national strategy in 1998 designed to strengthen the research area of \textit{ICT-supported learning}.

\textsuperscript{16}I use it here in the plain sense that computers have become part of domestic ways of living.

\textsuperscript{17}Source: \url{http://www.danskskoleweb.dk/lieberg.htm}, accessed on August 23, 2008.
Helle Mathiasen (2002) investigates the political expectations that have carried the arguments for increasingly focusing on ICTs in education. She delivers several historical insights into the different movements that have taken part in this development. One interesting detail is that up until the 1990s, the term Electronic Data Processing or EDP (EDB) was used in Denmark. In the 1990s, the term information technology (IT) was primarily used, and since the beginning of this century, the term information and communication technology (ICT), has become more common. Mathiasen’s research illustrates that since the 1990s we have gone from political recommendations in 1991 that each school should invest in a computer room with at least fourteen computers to 1999, where the Danish government expressed that IT integration should be a requirement in primary and secondary education\(^\text{18}\) and not an option. In the late 1990s Internet connections became more common in Danish households, and at the beginning of the twenty-first century broadband connections spread in Denmark. Hardware, software and network technologies have developed in so many different ways that it would require a second (but probably numerous) thesis to investigate them thoroughly.

In 2002 when I finished my master’s thesis, most upper secondary schools in Denmark had Internet access and dedicated computer rooms (usually one or two) that needed to be reserved to use them. In 2004 many schools had invested in so-called flexible learning spaces – usually hallways – with computers where students could gather during the school day without having to book them in advance. From around 2002 up until today, wireless Internet and broadband connections in schools have increased. One Danish Ministry of Education consultant describes the ICT situation in November 2007 in relation to vocational colleges as follows:

- Most teachers have taken the pedagogical ICT license
- Many teachers have a laptop computer
- Many teachers get their Internet connection at home paid for
- Many schools invest in wireless connections and projectors
- Many schools have begun experimenting with ways to lend or help students buy laptop computers at a discount\(^\text{19}\)

Technologies, our conceptualizations of technologies, – the ways of approaching understandings and engaging in practices with technologies, as well as the reasons in relation to which we make these conceptualizations are continuously moving. Today, in Denmark, ICTs may have become mainstream and ordinary in education in the sense that their relevance in education is taken for granted. ICTs actively take part in the organizational make-ups. ICTs are no longer something Danish education engages with

\(^{18}\) Referring to what were ordinary upper secondary school programs at the time.

\(^{19}\) Source: notes from telephone conversation with a consultant from the Danish Ministry of Education on November 8, 2007.
only on special occasions. ICTs are, as illustrated in the above, being described and enacted in various ways as being generally accepted as an integral and necessary aspect of everyday ways of living in education in Denmark. Today, ICTs have in this sense become ordinary ingredients in educational activities, and in this sense it is possible to talk about the mainstreaming of both ICTs and e-learning. Throughout this thesis, however, this approach is being contested empirically as the continuously moving engagements with the Studynet at HBC indicate that we ought to remain uncertain about the ways in which ICTs can work to affect our lives.

**Imaginaries of computer-mediated learning and time-space independencies**

The concept of e-learning is often accompanied by imaginaries of learning as something that can be computer-based and computers are often depicted as means to free learning of time-space constraints. When Danish learning theorist Knud Illeris writes, “This form of learning has the great practical advantage that it is possible to participate exactly whenever and wherever it suits each individual’s everyday life” (2007, p. 31), he is referring to what he calls net-based learning. According to Illeris, net-based learning is “all learning connected with the use of computers” (ibid.) and can happen whenever and wherever one wishes to connect. Illeris’ errand is not to discuss net-based learning; the author simply states what net-based learning is. Illeris’ brief statement defining net-based learning illustrates how relationships between ICTs and learning are (often) imagined and become represented in literature. From this, I extract some of the key issues and basic assumptions that relate to the ways in which relationships between ICTs and learning often become enacted in literature, for instance:

- Learning can be net-based.
- Net-based learning can happen anywhere at any time for anyone.
- Individuals can access net-based learning anywhere anytime.

Similar representations can be found in a report authored by the Danish Ministry of Science, Technology and Innovation (2003) which defines e-learning as: “E-learning (electronic learning) is one of the terms for learning in which the computer is involved in one way or another” (ibid., p.5). What is interesting about this quote is the imaginary that e-learning is electronic learning and that this is a matter of learning involving computers. The Danish Ministry of Science, Technology and Innovation report refers to the EU Commission’s broad definition, which is: “E-learning is defined as the use of new multimedia technologies and the Internet in order to elevate the quality of teaching by making different resources and services more easily accessible, and by exchanging information and collaborating.” (ibid., p. 6).
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In this quote the EU Commission emphasizes e-learning as a way to *elevate teaching*. Thus, e-learning is being depicted as *instructional activities* involving ICTs, which are then represented *as if* they represent better learning. This imaginary of a direct link between instruction with ICTs and better learning is one that easily translates into engagements in which computers equal better learning.\(^{20}\) Thus learning may be referred to as matters of net-based/computer-based/net-mediated/computer-mediated learning, i.e. e-learning or learning where the central instrument/cause/actor is ICT.

The Danish Ministry of Science, Technology and Innovation report refers to four overall – but not exhaustive – variations of models for e-learning:

- **Model A**: E-learning in which the learners never meet physically and solely learn via the computer. There is no dialog between the involved parties.

- **Model B**: E-learning in which the learners never meet physically but dialog between participants is supported by virtual environments.

- **Model C**: E-learning in which the learners alternately learn in class or work individually with the computer, i.e. at work or at home.

- **Model D**: E-learning in which the learners exclusively learn in a class, and where the computer is used as a teaching tool.

( Ibid., pp. 6-7)

The report uses formulations like “exclusively learning via the computer” and “sometimes e-learning stands alone” (Ibid., p. 7). Both Illeris’ presentation of net-based learning and the concepts of e-learning referred to in the Ministry’s report represent *relationships between ICTs and learning as immediate, causal and direct matters*. Immediate in the sense that learning is imagined to be instantaneously linked with the use of computers, causal in the sense that engaging in instruction involving computers is taken to be a matter of engaging in learning, and direct in the sense that learners are being depicted as learning *through* computers the second they engage with them.

Model A e-learning is described as typically involving tests, simulations, and computer-based training. It is seen as being *independent of time and place as well as other people* and to involve *no transportation time or costs*.

\(^{20}\) Ryberg (2007) makes a similar argument and discusses the problem of assuming that intensive use of ICT leads to highly-developed technological skills and that the intensive use of ICT and technological skills will *in themselves* lead to new ways of learning.
Connecting

Model B e-learning is described as typically being distance education with virtual interaction between students and teachers. It is seen as being independent of time and place in relation to asynchronous dialogs. Also here there is no transportation time.

Model C e-learning is referred to as blended or mixed-mode learning (face-to-face and virtual learning), and this, according to the report, is the most widely distributed version in Denmark in relation to longer courses and educational settings. This is partially because it supports the Scandinavian educational tradition emphasizing dialog between students and teachers, and partially because it – according to the Ministry – is particularly apt for supporting the social dimension (ibid., p. 12) that is an important aspect of education. Supposedly the disadvantage of this e-learning model is less flexibility for the individual because of scheduled face-to-face seminars. Physically attending teaching is described as a matter of losing the ability to be independent of time and place.

Model D e-learning is described as ICT in face-to-face teaching. Supposedly, the advantages are that this form of e-learning can make learning more engaging and varied as well as be supportive of differentiation and learning styles.

Instead of including all of the pros and cons of the various e-learning models, I have selected some of the arguments that I see as central to the ways in which ICTs and e-learning are presented as actors in education in Denmark and come under headings as varied as, e.g. flexible learning, distance education, computer-based training (CBT), technology-supported teaching, and net-based learning.

The Ministry (2003) primarily relates e-learning to formal instructional matters. Both Illeris and the Ministry emphasize the anywhere, anytime element as a particular advantage and as quality related to engagements with e-learning. Illeris assumes this to be the case in all cases of computer use, whereas the Ministry takes it to be a quality relative to the opportunities for working virtually (meaning no physical boundaries) and asynchronously (meaning no time boundaries). The imaginary about net-based or computer-based learning as being time and place independent is one of the central arguments that has followed the implementation of ICTs and e-learning in education. This thesis illustrates empirically that these imaginaries and enactments of relationships between ICTs and education are not sufficient and can be problematic when used as the point of departure for describing and understanding the complexities of the movements engaged when relationships between ICTs and education are enacted.
ICT integration in HHX and HG

The current situation in Denmark is that we do not actually have much knowledge about ICT integration in secondary education. We know little in relation to upper secondary education; we know very little about commercial upper secondary education (HHX), and hardly anything about commercial basic vocational and training programs (HG) and their engagements with ICTs.21

Research with a focus on ICTs in Danish upper secondary schools

One of the first, and at the time, largest research, development and assessment projects in Denmark with a focus on ICT integration in upper secondary schools was The Electronic Schools project, which involved following experiments with personal laptop computers for two upper secondary school classes from 1995-1998. Mathiasen took part in writing the evaluation report (Hansen, Kjær & Mathiasen, 1999), and she conducted a consecutive research project that is reported on in her PhD thesis (Mathiasen, 2002). Both the evaluation report and the thesis share a common feature that results from the research appear in the form of references to shared themes and experiences, e.g. “many students express”, “the students focus on”, “the students have observed”, etc.

The next large-scale research and development project was called The Virtual Upper Secondary Schools project and covered 2002-2004. The Virtual Upper Secondary Schools project involved sixty ordinary upper secondary schools and seventy-nine development projects. The consecutive research was conducted by a research team lead by Mathiasen, who summarizes the research findings in consecutive research reports (e.g. Mathiasen, 2003). Mathiasen (ibid.) writes that in line with many of the development projects, the consecutive research has focused on web-based forum communication. The Virtual Upper Secondary Schools project is the only project in Denmark in relation to secondary school programs that has involved research with a focus on knowledge sharing systems. Mathiasen’s emphasis is on teaching environments involving combinations of web-mediated communication forums and face-to-face communication forums. It is also the only large-scale research and development project conducted in Denmark with a focus on secondary school programs and ICTs from 1998 till today.

Though I would like to refer to these research results, I find it problematic as they gather experiences and draw common conclusions from a variety of diverse school

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21 According to the vocational education and training (VET) consultant at the Danish Ministry of Education, no comprehensive view exists of ICT integration in VET (Source: telephone conversation with the aforementioned consultant at the Danish Ministry of Education, October 1, 2007).
settings, situations, development projects and ICTs without making their specific and heterogeneous nature explicit. Therefore, it is impossible to tell whether a reference actually contains many different relationships that are unlike, e.g. when Mathiasen (2003) writes: “According to the students, instruction that does not require one to be present is a way of organizing that they would like to continue with if it does not become a matter of individual lessons during the course of the school day …” (ibid. p. 26) It is impossible to tell from this reference which students and which activities that do not require one to be present are being referred to. Nowhere in the report is there mention of the author making an effort to conceptualize the ICTs involved in the teaching environments involving combinations of web-mediated communication forums and face-to-face communication forums. There is no elaboration of what activities that do not require one to be present might contain or how they might be contained differently in the everyday ways of living at dissimilar schools and in relation to a variety of teaching activities. This thesis problematizes this kind of approach for describing engagements with ICTs. It is an approach that focuses on what can be collected as common themes and expressions. Using these ways of describing things, the heterogeneous specificities of engagements with ICTs are downplayed, and in this process, things may appear as being much more similar and unidirectional than what may actually be the case. Throughout the analyses in this thesis, the specificities of engagements with the Studynet will be brought to the fore. This movement entails discussions of what enacts sameness and differences.

To my knowledge, few other Danish researchers are currently engaged with research projects focusing on ICT integration in relation to secondary school programs in Denmark, and they all relate to the Danish Research Centre on Education and Advanced Media Materials project on learning resources and materials.22 The projects are described on-line as being primarily concerned with particular learning materials/resources and their subject related usages. Some of them engage with commercial upper secondary schools. According to the Danish Ministry of Education (2001b), there is a lack of research on relationships between ICT and upper secondary schools. This still seems to be the case.

This description of the current status of research about ICTs and e-learning in relation to secondary school programs in Denmark is supported by Dalsgaard (2008), who has done a national report on the political initiatives which forms part of the background for use of ICT in education. There have been development projects with ICTs in secondary school programs, but either they have not involved researchers, or they may have focused on assessing the projects, or the effects of projects. Research may exist that I

am not familiar with; however, a literature search conducted by the Danish Educational Library in 2008, as well as conversations with consultants from the Danish Ministry of Education in 2007 and Mathiasen in 2008 did not reveal additional research in this area. In 2008, I also searched the national research database for research on secondary school programs/(commercial) upper secondary schools/vocational education and training and ICTs/e-learning. There appears to be a general lack of basic research in Denmark seeking to understand ICT integration and e-learning in secondary school programs as matters related to the constitutive entanglements of everyday ways of living in education – especially in relation to commercial upper secondary schools and vocational education and training (VET). According to consultants at the Danish Ministry of Education in the fall of 2007, the government at the time had no plans for initiatives to launch and support research and development projects focusing on ICTs and e-learning in relation to secondary school programs.23 Furthermore, the VET consultant commented that no comprehensive view exists of ICT integration in relation to VETs.

This thesis takes its point of departure in the research question: How does a knowledge sharing system – called the Studynet – become part of and take part in moving the everyday ways of living associated with the secondary school programs at a Danish business college? Overall, research focusing on relationships between ICTs and secondary education in Denmark can be characterized as being either experimental or consecutive research with a focus on special developments in teaching and learning activities with new ICTs, or both. Project learning scenarios with ICTs can be viewed as a contribution to furthering development of e-learning research that emphasizes a relational focus on understanding everyday ways of living involving ICTs in commercial secondary school programs without taking a learning strategic and pedagogical approach (to begin with) to understanding relationships between ICTs and education.

The International Survey of Upper Secondary Schools
(ISUSS 2004)

One aspect is the ways in which researchers produce knowledge about relationships between ICTs and secondary education. Surveys also produce knowledge about these relationships. Surveys claim to be taking stock of how ICT integration in schools develops. This leaves the imaginary that we can perhaps unproblematically move between surveys to compare the results and gather information. Surveys, however, also take part in producing the ways in which we look at and understand aspects of ICT

23 Source: notes from telephone conversations with consultants at the Danish Ministry of Education on October 1, 2007 and November 8, 2007, as well as a meeting in person on September 19, 2007.
Connecting integration. One central problematic of surveys is that they refer to terms like IT, ICT and upper secondary schools as if they address the same phenomena. These monolithic terms, however, cover increasing amounts of heterogeneous assemblages of technologies and everyday ways of living with these.

The results reported on in surveys can also become translated into relationships that radically alter their apparent outcomes. One example of such ambivalence occurred in 2004 when the Organization for Economic Co-operation and Development (OECD)\textsuperscript{24} survey \textit{The International Survey of Upper Secondary Schools (ISUSS)},\textsuperscript{25} according to a press release from the Danish Ministry of Education (2004), placed Denmark \textit{in the lead} in relation to the development of teachers’ competencies and the level and use of ICT. The same year, in the report \textit{The Information Society Denmark: IT Status}, the Danish Ministry of Science, Technology and Innovation presented statistics from the Nordic report on the ISUSS figures and the same results were portrayed in a much less flattering light (2004, Chapter 7). While Denmark may hold a top ranking position internationally, more than 50\% of the Danish upper secondary school leaders still experienced the following barriers when it came to using computers in school\textsuperscript{26}:

- Too few PCs
- Too narrow a selection of software
- Unsatisfactory teacher competencies and habits related to using PCs in teaching
- Difficulties in integrating PCs in classroom teaching
- Difficulty in having a suitable amount of access to PCs for each class
- Four out of ten schools report on unsatisfactory preparation time for teaching with PCs

Internationally, Denmark may be doing well because we seem to have lower percentages on the questions concerned with barriers for using computers than the other thirteen OECD countries we compare ourselves to; when the Danish figures alone are considered, however, the fact remains that there seems to be quite a few experienced barriers for ICT integration in schools.

\textsuperscript{24}“OECD brings together the governments of countries committed to democracy and the market economy from around the world … The Organisation provides a setting where governments compare policy experiences, seek answers to common problems, identify good practice and coordinate domestic and international policies. For more than 40 years, OECD has been one of the world’s largest and most reliable sources of comparable statistics and economic and social data. As well as collecting data, OECD monitors trends, analyses and forecasts economic developments and researches social changes or evolving patterns in trade, environment, agriculture, technology, taxation and more.” Source: \url{http://www.oecd.org/}, accessed on July 29, 2009.

\textsuperscript{25} Based on answers from 4,000 upper secondary schools’ leaders from fourteen OECD countries.

\textsuperscript{26} The ISUSS figures are based on a status made in 2001.
E-learning Nordic 2006

The *E-learning Nordic 2006*\(^{27}\) survey\(^{28}\) claims to generate knowledge about the perceived impact of ICT on schools in the Nordic countries. The aim of the survey was:

… to discover and document the impact of ICT on education within three key areas:

- Pupil performance
- Teaching and learning processes
- Knowledge-sharing, communication and home-school cooperation.

(Ramboll, 2006, p. 7)

Characteristic of this survey is that ICT is understood as a *driver* with certain *inherent* qualities and potential like that of *enabling* differentiation. *E-learning Nordic 2006* does not question the topic or thoroughly debate the methodology of the survey, e.g. why does it make sense to think in terms of ICT as a *single* isolated factor that impacts learning? *E-learning Nordic 2006* is concerned with e.g. *how much* ICT-based communication, knowledge sharing and cooperation are being used. The survey focuses on the *experienced impact* of these activities in relation to certain predefined factors like that of improving communication with pupils and students. Neither the imaginary that communication, knowledge sharing and cooperation can be *ICT-based*, nor the concepts of improvement are discussed in the survey. The survey takes its point of departure from the basic assumption that: “… there is a causal relationship between the use of ICT in schools and pupils’ learning” (Ramboll, 2006, p. 21).

While we may become more knowledgeable about the *frequencies of use* of ICT for certain activities like communication, as well as whether pupils, teachers, leaders and parents experience this (in general terms) as creating better communication, *E-learning Nordic 2006* does not explore the variety of ways in which links between

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Ramboll describes itself as having a solid position on the market as one of the leading suppliers of consulting work for the public sector. Its customers include, for example, ministries, public agencies, regions and municipalities. Source: [http://www.ramboll-management.dk/om%20os.aspx](http://www.ramboll-management.dk/om%20os.aspx), accessed on July 29, 2009.

\(^{28}\) Involving the four Nordic countries (Denmark, Sweden, Norway and Finland), including 224 schools, 8,000 respondents (students, teachers, school leaders, parents), and primary (5\(^{th}\) and 8\(^{th}\) grade) and secondary (second year) education.
communication and ICTs are made in relation to school, and what it means that e.g. communication becomes better. The survey presents ICTs as carrying the potential to reinforce theories (e.g. about learning styles and differentiation) in practice, “… as ICT in itself offers the possibility to communicate content in many different ways and to challenge pupils at different levels” (Rambøll, 2006, p. 26). The overall conclusion of the survey presented in the media was that: “Students, teachers and parents believe that IT has a positive effect on the schools’ overall goal – to improve student learning” (Ministry of Education, 2006).

**IT in Upper Secondary Schools 2005**

Another Danish survey completed in 2005 called *IT in Upper Secondary Schools (IT i de gymnasiale uddannelser)* by the Danish Evaluation Institute (*Danmarks Evalueringensinstitut, EVA*) claims to assess ICT integration in schools with a focus on pedagogical practices. Both E-learning Nordic 2006 and IT in Upper Secondary Schools 2005 may be viewed as engaging in (a Danish context) fairly recent forms of surveys about ICT integration in schools that are not primarily concerned with the amount of computers, Internet connections, etc. Both surveys intend to study the ways in which ICTs are being used in education for promoting especially teaching relevant purposes. Until 2001 in Denmark ICT integration in schools was primarily concerned with IT infrastructure and teacher competencies. In 2001 the Danish Ministry of Education launched *Denmark’s Strategy for Education, Learning and IT* (Danish Ministry of Education, 2001) in which the then Minister of Education, Margrethe Vestager, announced that Denmark engaged in the movement from a focus on learning to use IT to a focus on using IT for learning. Both E-learning Nordic and the IT in Upper Secondary Schools 2005 surveys can be said to follow this line of thinking. Basically, they take ICT integration in instructional activities as their primary interest, but they contextualize them differently. IT in Upper Secondary Schools 2005 focuses on six areas:

- ICT facilities and the physical framework
- Structural framework
- Ways of using IT
- Working to improve student competencies
- Competency development for teachers
- Development plans for ICT integration in teaching activities

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29 The institute conducts evaluations of daycare, schools and education programs. EVA conducts both self-initiated and a number of evaluation assignments on behalf of the Danish Ministry of Education. See: [http://www.eva.dk/om-eva/om-eva/opgaver-og-handlingsplan](http://www.eva.dk/om-eva/om-eva/opgaver-og-handlingsplan), accessed on July 29, 2009.
Neither E-learning Nordic 2006 nor IT in Upper Secondary Schools 2005 are explorative methods in the sense that they start by expressing uncertainty about the nature and relationships of the things to be surveyed. They start with basic assumptions – imaginaries – about the matters at hand, and thus also what makes sense to ask. The IT in Upper Secondary Schools 2005 survey asks, “To what extent do you use IT in the following ways to prepare your teaching?” This question assumes that some ways are interesting and presents the following ways to be evaluated:

- Searching for information on the Internet and in databases
- Communicating via e-mail or other communication platform
- Putting materials on the net
- Note taking
- As a tool to correct written work

The EVA report (2005) on ICT integration in Danish upper secondary schools is based on empirical materials from seven upper secondary schools (including commercial upper secondary schools) representing four kinds of Danish upper secondary schools: STX\textsuperscript{30}, HF\textsuperscript{31}, HHX and HTX\textsuperscript{32}. The seven schools were identified by EVA as working with a particular emphasis on ICT. The way in which the survey has been conducted and presented, however, unfortunately does not exactly present groundbreaking knowledge about the status of ICT in upper secondary schools in Denmark. First of all, the questions focus on how much teachers and students use ICTs in generalized ways. Focusing on usage in this manner says little, if anything, about the ways in which ICTs take part in the everyday ways of living in education. Furthermore, it is unclear how, e.g. EVA came to the conclusion that it should ask teachers about ICTs as tools for the above-mentioned activities.

EVA’s survey presents ICT integration in relation to particular activities like searching for information, but the reader does not become more knowledgeable about how, e.g. ICTs take part in a variety of ways of searching for information. The reader is only informed that some programs use computers and the Internet for, for instance, individual and joint activities (and this is assumed to be positive), but which ICTs and ways of working individually or jointly with ICTs in everyday ways of living is not a part of the survey. In several places EVA states that interesting examples were found, but they are not elaborated upon in detail in the report, e.g. that ICTs were used in relation to:

\textsuperscript{30} STX or High school diploma – upper secondary school leaving examination.
\textsuperscript{31} HF or upper secondary shorter general education program – upper secondary school leaving examination.
\textsuperscript{32} HTX or higher technical examination.
As will be illustrated throughout the thesis, the ways in which ICTs take part in education are much more manifold and heterogeneous than what is depicted in surveys like ISSUS 2004, E-learning Nordic 2006 and IT in Upper Secondary Schools 2005. These surveys represent categorial approaches that produce what Rogoff (2003) calls the box problem: How can everyday ways of living with ICTs be fitted into the categorial boxes made available by surveys? This may in turn create the effect that what we believe we are looking at appears much more ‘homogeneously boring’ than what is actually the case.

This thesis shows that if we look more closely at the different ways in which particular ICTs become entangled with education, we will find that a wide variety of different things get listed under headings like handing in assignments (which is often considered mere remediation of old practices) and communication (which is mostly considered engagement in new practices). These surveys do not include additional detailed studies of the variations of ICTs or the ways they take part in e.g. doing assignments, education, etc. Of course this may not be their purpose either. They do, however, represent particular kinds of efforts made to measure things. Based on this context, I dispute that ‘we’ currently mostly relate our knowledge about relationships between ICTs and secondary education in Denmark on these kinds of knowledge practices. This is problematic because stating that ICTs (in general) are being (and should be?) used frequently for e.g. doing assignments does not express anything about the complicated and heterogeneous relationships that may be at play when ICTs become associated with doing assignments. Furthermore, it does not say anything about how doing assignments with ICTs may radically transform the activity of doing assignments as well as other agencies of relevance to schools.

**Summation**

Little current knowledge exists about the concrete and situated ways in which particular ICTs (have) become engaged as actors in everyday ways of living related to secondary school programs in general and more specifically HG and HHX in
Denmark. Few research projects have been conducted and they focus on particular development projects in the form of consecutive research. One common denominator for these projects is their tendency to favoratize and summon common themes across what may very well be heterogeneously constituted events. In addition, they tend not to thoroughly engage with the nature of the ICTs involved in the research. The recent surveys on ICT integration in relation to upper secondary schools take general approaches that emphasize how many and how often ICT is used for particular purposes. They are not concerned, however, with the different ICTs that are being engaged in schools, the variety of ways they are being engaged or the heterogeneous specificities of the relationships that engage ICTs in schools. Surveys and research tend to describe ICTs and ICT usage in general terms, removing the entanglements inside which particular ways to engage ICTs exist. In this sense this thesis may be viewed as contributing to further elaborations on current enactments of relationships between ICTs, HG and HHX education programs. While the existing surveys about ICT integration and e-learning in secondary school programs in Denmark may provide us with numbers indicating how many and how much ICT and e-learning is being used in schools, we generally lack insight into the ways in which particular ICTs – in this case a knowledge sharing system – become part of and take part in moving everyday ways of living in HG and HHX education programs.

Knowledge sharing systems as actors in Danish education

The spread and explosive growth of so-called knowledge sharing systems in education in Denmark especially took off during the 1990s in relation to distance education and open university programs. In relation to primary and secondary schools, the role of knowledge sharing systems has a shorter and less well-documented history. Intranets became more common in the late 1990s when the Sector Net (Sektornettet) was offered in 1993 to primary, secondary and tertiary schools by the Danish Ministry of Education. The Sector Net provided schools with access to the Internet as well as several services, including:

- [www.emu.dk](http://www.emu.dk) The Electronic Meeting place for the education world

33 According to the Danish IT Terminology Committee, intranet refers to “A technology that enables an organization to internally access documents and services via internet protocols, and supports group communication” (The Danish IT Terminology Committee under the Danish Language Council: [http://www.dsn.dk/it-dansk/](http://www.dsn.dk/it-dansk/), accessed on March 4, 2009.). According to this definition, intranet may be understood as a broader term covering many different ICT platforms allowing organizations to internally engage with various resources and activities online. Thus, intranet may cover a wide range of names for variations of ICT systems/platforms, e.g. content management system (CMS), virtual learning environment (VLE), managed learning environment (MLE), learning platforms and knowledge sharing systems etc.
Webhotellet provides space for educational institutions to present homepages with their own domain name.

SkoleKom provides access to a conference system used by more than 250,000 teachers and pupils. All users receive their own e-mail address.

Informationsbasen with tools, articles, courses and self-study materials.

At the end of the 1990s, intranets became more common actors in education, and since the beginning of the twenty-first century, a wide variety of platforms labeled knowledge sharing systems, (e-)learning platforms, virtual learning environments – among others – became increasingly acknowledged as normal ingredients in education at all levels. In 2001 the Danish Ministry of Education launched the Danish Strategy for Education, Learning and IT (Ministry of Education, 2001), which emphasizes the need to develop network based tools for intensified knowledge sharing between educational institutions, teachers, students, parents and external national as well as international partners. Furthermore, in 2001, The Virtual Upper Secondary School – The Ordinary Upper Secondary School in the Knowledge and Network Society: Vision and Strategy emphasized access everywhere to education and educational resources (Ministry of Education, 2001a). The naturalization and legitimization of knowledge sharing systems in education was particularly manifested in the Danish Ministry of Education’s decision in 2004 to financially support the distribution of knowledge sharing systems in primary schools (Rambøll Management, 2006). Furthermore, in 2004, the upcoming upper secondary school program reform for 2005 introduced so-called virtual teaching as a possible variation in the everyday teaching forms in education. Partially associated with these events, a new (optional) knowledge sharing and knowledge sharing systems module was added to the Danish Pedagogical IT-license for Upper Secondary School Teachers in 2006. Also, in the recent Danish National Strategy for ICT-supported Learning, knowledge sharing and learning management systems are referred to as the technological points of departure for greater investments in e-learning (National IT and Telecom Agency, 2007, p. 16). The aim of the strategy is to make Denmark a world leader with regard to e-learning.


Under the IT in Danish primary schools program, known as ITIF, which ran from 2004-2007, the Danish Ministry of Education provided financial support to primary schools investing in knowledge sharing systems (videndelingssystemer). “The term ‘knowledge sharing system’ is used by the Ministry of Education as a collective term for a number of learning platforms developed for instructional and educational use. In the beginning of 2008, 98% of the country’s primary schools are estimated to have a knowledge sharing system.” http://www.uvm.dk/Uddannelses/Folkeskolen/Om%20folkeskolen/Fokusomraader/It%20i%20folkeskolen/Programmet%20i%20folkeskolen%20ITIF/Videndelingssystemer%20tilskud%20til%20skoler.aspx, accessed on March 4, 2009.

The following section presents the ways in which knowledge sharing systems have become represented by governmental institutions in Denmark and England.

**Becta and the Danish Ministry of Education**

The British Educational Communications and Technology Agency (Becta) inspired by the Joint Information Systems Committee (JISC) makes a distinction between the terms managed learning environment (MLE) and virtual learning environment (VLE):

The term Managed Learning Environment (MLE) refers to the whole range of information systems and processes of a college or university (including its VLE if it has one) that contribute directly, or indirectly, to learning and the management of that learning.

There is sometimes confusion between a VLE and a MLE. The term Virtual Learning Environment (VLE) is one possible component of a MLE: It refers to the component(s) within an MLE that provides the “online” interactions of various kinds which can take place between learners and tutors, including online learning.

(Becta, 2002, p. 1).

In addition to these definitions, another Becta report (2007) reviewing the research literature on the use of virtual learning environments in education adds the descriptions used by the commercial sector, i.e. web-based curriculum management platform, VLE and connected learning community (Encarta Class Server, Microsoft), a collaborative learning community (Think.com, Oracle), a learning community and communications environment (Learning Village, IBM).

Descriptions move with developments of new ICTs, and furthermore, with efforts of IT companies and educational actors to establish particular ICTs as offering education something special that other products/solutions on the market do not. This is part of the marketing and sales strategies of governments, IT companies and education programs. But it is also part of the sales and marketing strategies engaged by researchers. As researchers, we also position ourselves in the landscape we imagine exists and take part in enacting. This means that sometimes we use the same labels as a reference to different things, and we may also label the same things differently. What in one context

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38 “This report examines the evidence of where these tools are being used, and the potential benefits which are being claimed. It looks across all sectors, and takes an international as well as a UK perspective, before considering the potential implications for the UK schools sector – what can be learnt that is transferable to practice in schools?” (Becta, 2007, p. 6)

is being referred to as a VLE may in another context be referred to as a web-based course management system.

In Denmark, the Ministry of Education has chosen the overall terminology *knowledge sharing system* to cover a wide range of very different technologies and solutions. Both the British Educational Communications and Technology Agency and the Danish Ministry of Education choose to use *nationally common labels* (England: MLE and VLE and Denmark: Knowledge sharing systems) to approach these manifold and incredibly diverse kinds of technologies and solutions. Both of these political actors also emphasize *functional specifications*\(^\text{40}\) that should, as a minimum, be fulfilled in order to be acknowledged as a VLE/knowledge sharing system.

The national approaches taken by Becta and the Danish Ministry of Education are *functionalist* in the sense that they categorize platforms on the basis of functionalities. However, as both the Becta report (2007) and a report by Rambøll Management (2007) about the state of knowledge sharing systems in Danish primary and lower secondary schools\(^\text{41}\) state, we know more about the *assumed potential* and *claimed qualities* of these technologies than about the *actual realizations* of them in practice. In other words, while we can talk about the marketing of functionalities, we need more knowledge about their actual ways of *functioning* (Callon, 2006).

In the following sections I present some approaches discussed and proposed by Danish e-learning researchers for understanding relationships between knowledge sharing systems\(^\text{42}\) and education. I believe that these approaches shed further light on two paradoxes: 1) that governments, IT companies, education programs and Danish researchers tend to describe ICTs as having certain qualities while simultaneously emphasizing that technologies alone do not make things happen, and 2) realizations of ICTs in practice often do not match the principal advantages described by the research literature (as mentioned by Rattleff, 2003). Henriksen (2003) calls it the problem of the *vanishing artifact* in relation to information systems research. Henriksen describes this research problematic as a problem relating to research that pays thorough attention to the *social* organization of things as central to realizing potential with ICTs, but that does

\(^{40}\) The Danish Ministry of Education emphasizes the following specifications: internal and external communication and collaboration, flexible planning, teaching and student tools, tools for handling materials (Rambøll Management, 2007, p. 1-2).

\(^{41}\) A survey including a questionnaire about the ways that primary schools use knowledge sharing systems in 2006, mapping of international experiences with the use of knowledge sharing systems in primary and secondary education, a selective questionnaire among 60 schools with representative use-profiles, focus group interviews at 9 primary and 2 upper secondary schools (Rambøll Management, 2007, p. 4).

\(^{42}\) Which they refer to as respectively VLE, e-learning platforms. They are all but one focusing on higher education. Presently there is no established research field around knowledge sharing systems in relation to primary and secondary education in Denmark.
not equally engage in inquiries about the nature of the things – the ICTs – that are imagined to contain certain qualities. This thesis is an attempt to articulate the artifact – the Studynet – as inherently coexisting with the constituting entanglements and everyday organization of things associated with HBC.

Net-based teaching platforms

No research is currently available on relationships between education and knowledge sharing systems in upper secondary school programs in Denmark that engages in enquiries on the nature of knowledge sharing systems. A great deal of e-learning research has been conducted in relation to further education and mostly in relation to so-called on-line, net-based, distance and net-supported education. My point of departure in the following is based on some of this research.

Net-based/web-based teaching platforms (Aarflot & Heiberg, 1999) is one label related to the wide diffusion and uptake of ICT systems as tools for distance or net-supported education in Denmark. In 1999, Aarflot and Heiberg list twenty-five different examples of these kinds of platforms divided into three categories: 1) total solutions, 2) solutions for group work, discussions, and conferences, and 3) other solutions. Using their method for labeling, ICT systems are categorized as being web-based platforms with certain types of qualities. These labels and categorizations invite an understanding of teaching as involving processes that can be based on ICT systems that are represented as providing contexts of activities particularly apt for the facilitation of certain activities e.g. group work.

In 2002, Heilesen and Ørum write there are a couple of hundred different products on the market referring to what they call computer-supported collaborative learning/work (CSCL/W) software. Nyvang and Pedersen have written an article entitled, “E-learning platforms: A complicated field” (2004), in which they point to different forms of potential e-learning platforms that can be applied as commercial products, open source software, and systems that are not labeled and marketed as e-learning platforms. The authors refer to platform labels such as learning management system (LMS), CMS (course/content management system (CMS), computer mediated communication (CMC), and computer-supported collaborative learning/work (CSCL/W). Nyvang, Tolsby and Dirckinck-Holmfeld (2004) propose a categorization of e-learning systems according to the central functionalities offered by different systems. They put forward three categories: Content deliverance systems (teaching systems), conference systems (communication systems) and groupware systems (collaboration systems). This way of classifying ICT systems is also based on a representation of functions as inherent to the technologies.
One could say that the Danish and British governments emphasize what you can and ought to be doing with knowledge sharing systems generally in education, i.e. what roles they can play, while e-learning researchers emphasize ways to organize and design instructional activities with ICTs that can facilitate learning processes in certain directions. In terms of the governments’ representations, choosing a knowledge sharing system is not about pedagogy and (e-)learning, it is a matter of organizing everyday ways of living associated with education. Both approaches, however, can be claimed to engage with a functionalist approach in the sense that they depict e-learning and (e-)learning platforms as matters of engaging in particular functions.

Intranets and conference systems

Intranets and conference systems were labels commonly used to describe ICT systems that became increasingly recognized as central actors in education in the 1990s. Sorensen describes conference systems as:

…the concept for the special type of communication systems (CMC) that allow one-to-one and one-to-many communication, but also to a particular extent support many-to-many communication (group communication). The special characteristic of the communication which is made possible in such a system is that it is asynchronous in time and space and that it uses writing as the means of expression in a process which substitutes face-to-face communication…

(1997, p. 80)

Sorensen is writing with reference to online education/learning, which she describes as third generation distance education. The author describes a movement where distance education has previously focused on one-to-one/one-to-many transmission models of communication, while online learning via conference systems enables many-to-many collaboration, interaction and communication. Sorensen speaks of conference systems as a means of entering third generation distance education. She argues that whereas first (i.e. e-mail correspondence courses) and second generation (i.e. audio and video broadcasting at the Open University in England) distance education looks at educational technologies as materials, third generation distance education understands educational technology as the organizer of instruction (ibid., p. 82). However, as Sorensen also remarks, the first usage of conference systems has engaged previous understandings of technology and distance education and thus not involved this so-called qualitative shift in development of distance education – going from understanding technology as materials to understanding it as the organizer of instruction. Thus, in order to realize the
potentials, Sorensen suggests that a move in the organization of learning processes is needed.

Sorensen’s text is an example of a research text, which on the one hand engages with certain imaginaries of the qualities of ICTs, and on the other hand claims that it is necessary to engage in particular ways of organizing activities in order to realize these potentials. Thus, although Sorensen (as most Danish e-learning researchers) does not imagine ICTs to be autonomous objects determining things, she does not explicitly engage in inquiries about the so-called “nature and quality of the conference system’s communicative space” (ibid., p. 83) either. The author simply states what the foundational property is: ’Asynchronicity in time and space is a foundational property of the conference system’s technical way of functioning. One could say that the asynchronicity in the system’s way of functioning directly supports the organization of communication/interaction between human beings.” (ibid. p. 84).

As I will discuss more thoroughly in Chapter 5, theoretically, Danish e-learning research is strongly associated with (social) constructivist movements. These movements take part in enacting directions for progress associated with research and education that deal with relationships between ICTs and education. The example with Sorensen in the above also partially illustrates this. The new ICTs at the time – conference systems – are to be understood as a means for engaging in a new distance education generation with an emphasis on new ideals about what it means to learn, teach and educate. While Sorensen depicts this movement as almost naturally associated with the new ICTs, her research also shows that this movement is not naturally associated with the new ICTs. Conference systems may become partially associated with this movement, if the educational approaches change.

E-learning and instructional technology paradigms

As Duus (2004)\textsuperscript{43} argues, different approaches to understanding e-learning will most likely affect the choice of e-learning platforms. Duus suggests that, overall, we are in fact dealing with four (ideal typical) coexisting e-learning paradigms:

- **A technological paradigm:** Pedagogy and learning are adapted to the selected technology.
- **A content based paradigm:** Content demands define the selection of technology, and the pedagogy is constructed around these choices.
- **A pedagogical paradigm:** The pedagogy is decided; the content is adapted to the pedagogy and the technology selected in relation to this.


- **A market based paradigm**: Mapping learning needs, content is modified, pedagogy is modified and the technology is designed accordingly.

Duus argues that technological and market based paradigms are more common in industry and that content based and pedagogical paradigms are more common in education. Nyvang, Tolsby and Dirckinck-Holmfeld (2004) suggest that there are three different approaches to analyses of VLEs as support for learning represented in the literature:

- Technology motivated (Wenger, 2001)
- Broad learning theoretical and pedagogic mapping (Reeves, 1997)
- Specific learning strategy (Nyvang, Tolsby & Dirckinck-Holmfeld, 2004)

Even though Nyvang, Tolsby and Dirckinck-Holmfeld call Wenger’s approach technology motivated, I would call it an analysis of the functionalities offered by different ICTs that may – according to Wenger – support the development and maintenance of communities of practices. What seems to be common to the three approaches is that they all take a learning theoretical point of departure and may in that sense fit into Duus’ pedagogical paradigm.

Koschmann (1996) outlines four different paradigms of instructional technologies and their respective learning theoretical points of departure, which emerged right around the advent of computers in the 1960s up to the 1990s:

<table>
<thead>
<tr>
<th>Paradigm</th>
<th>Inaugural event</th>
<th>Theory of learning</th>
<th>Theory of pedagogy</th>
<th>Research questions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Computer-assisted instruction (CAI)</strong> – behaviorist (1960s)</td>
<td>IBM’s release of Coursewriter I, the first CAI authoring tool</td>
<td>Knowledge acquisition</td>
<td>Instruction as transmission of knowledge</td>
<td>What are the instructional benefits of an introduced technology? Instructional efficacy?</td>
</tr>
<tr>
<td><strong>Intelligent tutoring systems (ITS)</strong> (1970s) – cognitive</td>
<td>Immigration of researchers from artificial intelligence (AI) into the educational arena</td>
<td>Information-processing – representation – problem solving as a process of defining a representation of a problem space … acquiring proper representations</td>
<td>Activities that facilitate the acquisition of representations (not so different from CAI but a more interactive approach, also in relation to more complex skills). Teaching as transmission model.</td>
<td>What is instructional competence?</td>
</tr>
</tbody>
</table>

Both CAI and ITS – knowledge as given and teachers as final authority
Connecting

<table>
<thead>
<tr>
<th>Logo-as-latin – constructionism/constructivism (1980s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inaugural event:</strong> Arose from an epistemological perspective inspired by Jean Piaget’s constructivism</td>
</tr>
<tr>
<td><strong>Theory of learning:</strong> Active process of knowledge construction</td>
</tr>
<tr>
<td><strong>Theory of pedagogy:</strong> Learning by personal discovery and inquiry, i.e. Seymor Papert’s programming computers – building artifacts … learners teach computers … focus on the learner</td>
</tr>
<tr>
<td><strong>Research methodology:</strong> Experimental intervention, control groups</td>
</tr>
<tr>
<td><strong>Research questions:</strong> What are the cognitive benefits of programming? Instructional transfer? Effects of learning to program on planning, metacognition, and other aspects of cognitive performance?</td>
</tr>
</tbody>
</table>

The above-mentioned approaches consider learning and instruction as primarily *psychological matters*.

<table>
<thead>
<tr>
<th>CSCL – social constructivism (1990s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inaugural event:</strong> Emerged as an alternative to earlier research fields that approach learning and instructional technologies as primarily psychological matters</td>
</tr>
<tr>
<td><strong>Theory of learning:</strong> Active individual and collaborative processes of knowledge construction</td>
</tr>
<tr>
<td><strong>Theory of pedagogy:</strong> Collaborative learning, learning by doing and mutual engagement, collaboration, problem-oriented group-based learning, problem based learning. Instruction as practice – teacher as facilitator/guide</td>
</tr>
<tr>
<td><strong>Research methodology:</strong> Experimental interventions, building new types of education. Social and cultural contexts as objects of study. Focus on understanding processes from participants’ viewpoints</td>
</tr>
<tr>
<td><strong>Research questions:</strong> How may technologies support collaborative ways of learning and methods of instruction?</td>
</tr>
</tbody>
</table>

Based on Koschmann (1996)

According to Koschmann, his list is constructed based on a Kuhnian analysis. He refers to Kuhn’s point about paradigms and paradigm shifts involving differentiations of research communities in the sense that each paradigm is viewed as incommensurable with another. Koschmann suggests that three paradigm shifts of this kind have taken place in relation to research on instructional technologies. According to Koschmann, other attempts have been made to make lists on the basis of the roles technology plays in instruction and he offers the following critique: “By focusing exclusively on the functional nature of the application, opportunities to consider other aspects of the work – such as the theories of learning that have motivated it in the first place – are missed” (1996, p. 17).

Notably, theory of pedagogy, research methodologies and research questions, seen in light of Koschmann’s paradigms of instructional technologies and learning theory, are represented as having moved with the different paradigms. What is also apparent, however, is that Koschmann goes to another extreme by not engaging with the technologies at all that have been involved in the different so-called instructional technology paradigms. As the above quote signals, this is perhaps partially a result of the fact that instructional technology paradigms are motivated to begin with by theories of learning. The list also produces another effect. The author’s chronological depiction
enacts progress in research, which means that researchers (may) not be inclined to pick up on practices associated with a research approach that was once popular in e.g. the 1960s. Also, since paradigms are viewed as incommensurable, stepping out of the boundaries is not going to be a likely.

Depicting instructional technology research as a matter of paradigms, traditions or generations has certain effects, which Sorensen and Takle (2003) also comment on when they acknowledge that the move to third generation distance education involved somewhat forgetting the central focus on technologies as materials.

Koshmann’s list of paradigms is interesting in this context because e-learning research is represented as being consistently about *instructional matters with technologies* within particular learning philosophical frameworks. Instructional matters are depicted as moving interobjectively in between learning philosophical developments, pedagogical developments, research methodologies and research questions/problems. While Koshmann indicates that the list is not all encompassing, Latour (2008) argues that it is exactly this kind of purification work in researchers’ inscription devices that takes part in eliminating the *branching bush* types of pathways – and thus complexities – from the descriptions.

Considering the above, it is hardly surprising that Nyvang, Tolsby and Dirckinck-Holmfeld place themselves in the category of learning strategy driven approaches. Andresen (2003) is another example of a Danish researcher who believes that *pedagogical innovations with e-learning* should be *strategically driven*. What he calls *e-teachers* should consider which learning principles to adhere to first, then which forms of organization and finally, which digital tools, communication and learning resources to follow. Levinsen’s (2005) analyses of what she calls nine central contributions to pedagogical and didactic models,44 which have – according to Levinsen – partially inspired Computer-Supported Collaborative Learning/Computer-Supported distributed Collaborative Learning (CSCL/CSdCL) research, also illustrate how relationships between ICTs and education have been extensively envisioned as *learning strategically driven* matters. In her article, *A History of E-learning: Shift Happened*, Linda Harasim writes45 that:

44 Including: Gilly Salmon’s five stage model to e-tivities and e-moderating; Diana Laurillard’s conversational framework; Annita Fjuk’s triadic relational model; Etienne Wenger’s communities of practice; Lone Dirckinck-Holmfeld’s didactic design of virtual environments; Elsebeth Korsgaard Sorensen’s PANEL model; Hilde Hiim and Else Hippe’s relational didactics; Erik Prinds’ spaces for learning; and Bent B. Andreasen’s FIKS model (Levinsen, 2005, pages 21-54).

45 The author notes that her article is about asynchronous types of e-learning (i.e. e-mail, computer conferencing forums) and not synchronous (i.e. real-time chat, videoconferencing) e-learning (Harasim, 2008).
A fundamental shift in understanding the very nature of learning and hence the definition, design, and delivery of education characterized the 1990s and early 21st century, and this shift became civilizational and global as educators and learners worldwide adopted networked e-learning.

(2008, p. 59)

The principle of collaborative learning may be the single most important factor for online networked learning, since it is this principle which provides the strong socio-affective and cognitive power of learning on the web.

(2006, p. 84)

Harasim may be more right in her assumption than she might realize in the sense that collaborative learning has become a way of partially circulating (social) constructivist movements, which understandings of relationships between ICTs and education have become partially entangled with. Thus, using Latour’s (2008) words, collaborative learning, rather than being a result of education, has happened to instructional matters.

Reeves (1997) takes a different approach, which outlines fourteen pedagogical principles from which to assess the different positionings of computer-based education. Reeves presents each principle as a continuum with multiple possible choices. Rather than depicting enactments of what he calls computer-based education as full commitments to an instructional paradigm, he describes mixtures of fourteen pedagogical principles. In Reeves’ continuums the principles depicted on the left side of the spectrum are associated with versions of the instructivist paradigm, whereas the principles depicted on the right side of the spectrum belong to the constructivist paradigm. Neither Reeves nor Andresen is particularly concerned with the choice of instructional ICTs; they are concerned with approaches to computer-based education (Reeves) and e-learning (Andresen).

The different approaches mentioned in this section can be viewed as variations of Duus’ pedagogical paradigm. Both Andresen and Reeves indicate that many combinations exist to choose from and that each choice influences the ways in which instructional

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46 The 14 pedagogical principles are: 1. Epistemology (objectivist/constructivist), 2. pedagogical philosophy (instructivist/constructivist), 3. underlying psychology (behavioral/cognitive), 4. goal orientation (sharply focused/ unfocused), 5. experiential value (abstract/concrete), 6. teacher role (didactic/facilitative), 7. program flexibility (teacher proof/easily modifiable), 8. value of errors (errorless learning/learning from experience), 9. motivation (extrinsic/intrinsic), 10. accommodation of individual difference (non-existent/multifaceted), 11. learner control (non-existent/unrestricted), 12. user activity (mathemagenic/generative), 13. cooperative learning (unsupported/integral), 14. cultural sensitivity (non-existent/integral). (Reeves, 1997, see fig. 15)

activities will be organized as well as which ICTs are actualized and the ways in which they become folded into education. Duus, like Sorensen (1997), argues that the approach to e-learning influences the way one engages with VLE/e-learning platforms/knowledge sharing systems.

A common feature of the above examples which could be categorized under Duus’ pedagogical paradigm is that they engage with e-learning as primarily being a matter of pursuing and realizing certain pedagogical principles (Reeves), a learning strategy (Nyvang, Tolsby & Dirckinck-Holmfeld), a learning theory (Wenger & Koschmann) and learning principles (Andresen & Harasim). This thesis illustrates empirically that in the everyday living at HBC this way of understanding engagements between the Studynet and HBC produces certain limitations on our options for understanding how engagements are made.

**Imagining knowledge sharing systems as educational platforms**

Generally referred to as *platforms, environments, systems* and *solutions*, labeling ICTs in this way encourages views that enclose the technologies, packaging *things as centers to move from and to*. These terms also suggest that they provide their own context, i.e. that they themselves are contexts of activity. This is a particular way of imagining ICTs as objects. Nyvang, Tolsby and Dirckinck-Holmfeld (2004) argue that e-learning systems are not neutral. According to them, it is possible to find particular forms of understandings of communication and learning *embedded* in various systems. The design of systems is therefore viewed as *enabling/inhibiting* particular ways of learning. As a result, they argue that it is necessary to consider what kinds of teaching and learning activities a system is supposed to be supportive of. This means being able to depict the relevant functionalities and their design according to the learning strategy one wishes to invoke. Nyvang, Tolsby and Dirckinck-Holmfeld are concerned with what they call a *social constructivist approach* to learning inspired by Etienne Wenger (1998). They are representatives of the research and practice field of Computer Supported Collaborative Learning (CSCL).

Acknowledging that the impressive impact of short message service (SMS) technologies on everyday living across the world could not possibly have been prescribed or foreseen, Nyvang, Tolsby and Dirckinck-Holmfeld argue that a “technology motivated” point of departure as found in Wenger’s (2001) analyses of

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48 Andresen mentions: a mixture between face to face and net based learning, a mixture between individual, pair and group based learning, interaction between materials, content and the participants’ interaction, the different roles of the teacher, i.e. as instructor, supervisor and consultant, as well as endurance and phases.
functionalities in technologies supportive of creating communities of practice is not helpful: “It is the learning activities that are central, and it is the learning activities one should design for when developing virtual learning environments.” (Nyvang, Tolsby & Dirckinck-Holmfeld, 2004, p. 211).

Based on Wenger’s theory of communities of practice and their formulation of a virtual project pedagogy, Nyvang, Tolsby and Dirckinck-Holmfeld end up with a model of analysis of e-learning systems based on their choice of learning strategy, which takes its point of departure in problem oriented project pedagogy. In their model they identify three parameters: Negotiation of meaning, work of coordination and resources and ways of handling resources. Even though the authors emphasize that it is not a matter of technological functionalities, their analyses assume inherent characteristics of technologies as being either ‘good’ at facilitating the three parameters or not. In this sense they end up practicing the same mistake they accuse Wenger of committing. Their point of departure is also the imaginary that e-learning systems and their various functionalities are in themselves ‘good at’ enabling particular activities: “Conferences are … good at explicating and making visible negotiations of meaning …” (Nyvang, Tolsby & Dirckinck-Holmfeld, 2004, p. 223).

Nyvang, Tolsby and Dirckinck-Holmfeld’s article is filled with these sorts of descriptions claiming inherent qualities of technological functionalities. Georgsen (2003), who argues that technological fantasy is central to our engagements with ICTs, suggests that technological fantasy develops through the use of technology. Through this use, patterns of use and new forms of use emerge, and this often occurs in spite of what may have seemed like apparent ICT limitations and opportunities. Georgsen proposes that option spaces emerge through engagements with ICTs in particular situations.

Another way of presenting Georgsen’s point is to suggest that conferences, like anything else, are momentarily made to be good at explicating and making visible negotiations of meaning. Technologies in themselves do not determine, they only take part, and hence can only be partially credited. Nyvang, Tolsby and Dirckinck-Holmfeld write that they base their conclusions on years of teaching experience in relation to two mix-mode master’s programs, their experiences however become black boxed49 in their analyses. It is unclear to the reader which workings and efforts have allowed them to

49 “BLACKBOXING: An expression from the sociology of science that refers to the way scientific and technical work is made invisible by its own success. When a machine runs efficiently, when a matter of fact is settled, one need focus only on its inputs and outputs and not on its internal complexity. Thus, paradoxically, the more science and technology succeed, the more opaque and obscure they become” (Latour, 1999, p. 304).
make, e.g. conferences “good at explicating and making visible negotiations of meaning”.

I agree that the idea of being explicit about one’s learning strategies and engaging in analyses of a platform at a preliminary state of choosing a system may provide some indications of what might represent limitations of a given system when the purpose is to make things work in specified/specifiable ways. However, these analyses should also be viewed as enactments based on imaginaries of what it takes to become a good e-learning system, and what good e-learning implies and thus must be understood as relative to those gatherings, e.g. when the aim is to enroll a particular learning strategy in education. This approach, however, apart from enacting a particular variation of education as highly linear, goal-oriented and culturally homogeneous, also performs the technology as a particular technology with inherent propensities.

Nyvang, Tolsby and Dirckinck-Holmfeld enact one of the VLE (Virtual U) they refer to as a good system in relation to the problem oriented project pedagogical practices they refer to. Heilesen and Ørum (2002, p. 13), however, categorize the same system as a highly structured and instruction oriented system in an analysis of different VLE. In 2002, Heilesen and Ørum categorized eight CSCW/CSCL systems used in higher education in Denmark using a model comparing them in relation to continuums between instruction and project work, on the one hand, and flexibility and structure, on the other hand.

Heilesen and Ørum’s model is interesting because even though they write that they are merely trying to visualize the many possibilities of use represented by the eight systems, the visualizations evoke instruction as forming an opposition to project work. Consequently, flexibility becomes enacted as the opposite end of a continuum in which structure is on the other end. However, instruction often takes part in project work and even when claimed to be flexible, activities are structured in various ways. Being flexible and being structured are not necessarily opposites (e.g. Hansbøl, 2004 shows an example of how Internet supported project work may become structured in various ways) as illustrated by placing them at a distance on each end of a continuum.

Heilesen and Ørum call their model of analysis a didactic comparison. Based on various hypothetical (though they call them realistic) use scenarios they ‘test’ some of the systems’ functionalities in relation to various imagined communication situations (individual, 1-1, 1-many, many-many). However, this model of analysis takes its point of departure in hypothetical situations without encompassing that the enactments perform teaching as well as technologies in particular ways as related to variations of communication situations.
Heilesen and Ørum’s analyses take their point of departure in hypothetical and generalized situations isolated from the complicated entanglements of everyday living. Hence, the propensity of the e-learning systems discussed here to facilitate e.g. education and communication is related to the authors’ imaginaries of what plays a role in each situation. Options for activities with the systems become an effect of the efforts Heilesen and Ørum put into their research. This way of judging options for activities with e-learning systems seems somewhat random and hardly fair.

The analyses provided by Nyvang, Tolsby and Dirckinck-Holmfeld, on the other hand, take their point of departure from generalized experiences gained from using Virtual U which is represented by sentences like: “The advantage of using conference systems such as Virtual U and First Class is that they focus on learning through dialog, reflection and negotiation of meaning rather than presentation and transfer of instructional material” (Nyvang, Tolsby & Dirckinck-Holmfeld, 2004, p. 223).

These features are hardly attributes of the platforms. Both sets of researchers, Heilesen and Ørum and Nyvang, Tolsby and Dirckinck-Holmfeld, tend to make it a feature of the technology to provide functionalities with inherent possibilities. Even though both sets of analyses try not to focus solely on the functions, they each represent attempts to report on action possibilities provided by particular e-learning systems.

Their ways of writing and presenting the systems show that they take for granted that the technologies are pre-invested with inherent qualities that relate to the functionalities. The functionalities are viewed as a priori supporting or not supporting certain activities. Each analysis is heavily invested with particular views on what is generally ‘good’ and ‘bad’, e.g. Heilesen and Ørum write: “To put it briefly, the more structured the access of a particular functionality is, the easier it becomes for the actors to participate” (2002, p. 12).

Another example of experience is that structure limits possibilities of actions, which in turn makes it more difficult to participate. The different analyses provided by the two sets of authors are effects of particular workings through which technologies become enacted as technologies for learning through activities viewed as particularly important to problem oriented project work and for various types of communication. Each of the analyses can be called both technocentric and functionalistic (Mol, 2002) in the sense that they describe the qualities of the systems as functions, i.e. ways of functioning belonging to the technologies.
Nyvang, Tolsby and Dirckinck-Holmfeld claim that it is the e-learning systems’ fundamental approach to pedagogy that varies. In this sense, e-learning systems are not neutral actors. Dalsgaard (2004) writes that a wide assortment of e-learning systems exists that mostly provides the same functionalities. He argues that what is needed to evaluate whether a system is appropriate is to make the point of departure functionalities related to educational activities, forms of teaching and learning theory. Dalsgaard writes that: “A functionality only represents a pedagogical approach when it is enacted in a specific activity as part of a teaching sequence” (2004, p. 242). At that point, however, Dalsgaard moves on to create evaluation criteria for forms of teaching and ways of learning. Both Dalsgaard and Nyvang, Tolsby and Dirckinck-Holmfeld seem to agree that some social practices and technological functionalities are more appropriate for supporting some forms of learning that can be said to relate to a particular view of learning. In other words, these authors view both educational practices and ICTs as representing particular learning theories. In this sense, Dalsgaard and Nyvang, Tolsby and Dirckinck-Holmfeld seem to assume direct links between theory and practice.

It appears to be a widely distributed assumption in Danish e-learning research that learning theories prescribe (though it is often argued e.g. by Dalsgaard that they do not) certain forms of teaching that are then viewed to be more related to these views of learning and knowledge than other forms of teaching. Much e-learning research thus chooses to design educational activities and educational research based on a particular view of the world. In this sense, e-learning research is a highly political matter. Some ways of organizing teaching and supporting ways of learning are legitimized, whereas others become marginalized and a priori neglected as representing ‘bad’/’wrong’ learning theories. The ‘good’ learning theories and strategies should of course create the foundations of an education. Nyvang, Tolsby and Dirckinck-Holmfeld formulate a learning strategy that is one representation of what they call a social constructivist approach inspired by the social theory of learning developed by Wenger. Dalsgaard argues that various learning theories relate to particular ways of learning and he translates these into certain forms of teaching. Both Dalsgaard and Nyvang, Tolsby and Dirckinck-Holmfeld’s approaches can be seen as examples of ways to translate learning theories into partially prescriptive devices – though the different sets of authors would most likely not agree on this – thereby framing education in particular ways.

Wenger et al. (2005) point out that since technologies evolve so must research engaging with understanding those technologies, as well as the understandings of processes involved in engaging with them. The challenge of the above-mentioned examples is that

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50 An imaginary that only makes sense when understanding functions as belonging to particular parts of the ICTs which may be viewed as standards.
they all take their point of departure in functional classifications, which may make sense at certain moments and in relation to particular assemblages of situations, but as Rattleff (2003) points out, the principal advantages of ICTs depicted by researchers are often not realized in other practices. This may be because they become challenged by the perpetual movements related to the continuous development of new ICTs, as well as the circumstances inside which heterogeneous assemblages of ICTs become entangled with multiple times, spaces and actors.

Furthermore, the ICTs that may have appeared as autonomous contexts and platforms in their own right (e.g. Outlook) with certain qualities in some times and spaces, in other (or maybe in the same times and spaces) may appear in relation to a composite of ICTs (e.g. as part of a knowledge sharing system). Previous autonomous ICTs may become platforms that include and contain composites of variations of ICTs, and they may become contained inside platforms partially existing with the composites of ICTs contained by them. What is contained, what contains as well as the ways in which things become contained are perpetually moving and not necessarily in the same ways, everywhere, at the same time, thus efforts to label and functionally define things may in fact freeze relationships and mobilize things as if they were more singularly detached – coherent things – instruments which may lead us to think of them as easily delineated actors with distinct roles and functionalities waiting to be applied.

Hørning Jensen (2004) writes that what makes e-learning so intriguing to work with is the pedagogical and didactic reflections it generates. Issues of e-learning move our ways of thinking in terms of questioning the ways, the whereabouts as well as the reasons for organizing education and understanding processes of learning. Hørning Jensen, however, also suggests that while ‘conventional’ educational research discusses with reference to many different pedagogical theories, the ICT pedagogical debate is often reduced to a contrasting choice between two ideal types of instructivism and constructivism. He argues that we should consider that a mix of different approaches is needed as each approach contributes with different forms of knowledge.

Another argument that is in line with Wenger et al.’s point about the continuous development of technologies is that it is also necessary to remain uncertain about the ongoing changes in everyday living and their entanglements with variations of ways of engaging in processes of learning and becoming knowledgeable. This, I believe, is also what most Danish e-learning researchers are indeed aiming for.

Researchers in Denmark (e.g. Bang, 2003) however, have claimed that learning platforms contain views of learning. In relation to the analyses and discussions presented in this chapter, the empirical gatherings presented throughout the thesis
suggest that perhaps learning theories by e-learning researchers are made to contain the different ICTs and practices with ICTs in question. This, I would like to suggest, can be – when taken as a general approach – a highly problematic approach, which does justice to neither ICTs nor everyday practices and movements with ICTs in education.

Pedagogical innovations can be viewed as happening through systematic, strategic and goal-oriented actions, as suggested by e.g. Andresen (2003). But innovations can also be understood as movements in ontologies, thus pedagogical innovations can be understood as movements in educational practices. In line with Bækkelund Jensen’s argumentation (2003), I choose to use the concept of movements instead of changes to suggest that we might not be dealing with changes in the form of 180-degree cultural turnaround revolutions, e.g. from the old to the new instructional paradigm. Bækkelund Jensen suggests however that we should instead understand changes as a continuum between almost business as usual and radically altering everything. Referring to Betty Collis, she suggests that we focus on enrichments and not just what she calls re-engineering. While Bækkelund Jensen uses the concept of cautious change, I choose movements as an intentionally weak concept which – I hope – in itself does not signal what movements may be characterized as. I wish to engage with research that remains uncertain about the changes involved in establishing relationships between ICTs and education. I do not wish to begin by assuming that changes are matters of e.g. either enrichments or re-engineering, and that they are to be found at each end of a scale/continuum.

(Danish) Researching ICTs in entanglements with education

In the research report from the first period (2002/2003) of the Virtual Upper Secondary Schools Project, Mathiasen writes:

IT is widely used and with great success at the schools when it comes to administrative functions – both school administrative functions like registration of absences and alterations in the schedule and teaching administrative functions like assigning homework and teaching plans. IT use has not been as visible when it comes to specific teaching related use of IT.

(2003, p. 43)

The term culture is used in the ‘ordinary’ sense and covers ideas, practices and customs produced and shared by a group. I do not engage with discussions of different conceptualizations of culture as this would constitute an entirely different project (see e.g. Hastrup, 2004), though many of my discussions could have been framed as such.
Mathiasen mentions that often when researchers refer to IT use (in this case web-based communication fora)\(^{52}\), the functions of use are not being explicated. According to the author, her research shows that it is possible to distinguish between the administrative functions and the pedagogical functions connected with didactic approaches to teaching activities. Thus, Mathiasen distinguishes between three categories of what she calls web-based forum communication:

- Teaching related administrative routines: One-way communication between teacher/students to students, i.e. the teacher assigns homework, makes teaching syllabuses available, etc.
- Teaching related communication as dialog: Involves a thread of at least three messages where a minimum of two persons are involved. This category relates to subject related communication, i.e. subject related questions, process writing, evaluation of assignments, etc.
- Other forms of administrative communication: I.e. information from the administration, grades, absence registrations, etc.

(Mathiasen, 2003, p. 23)

As the Virtual Upper Secondary Schools Project was considered a lighthouse project involving sixty upper secondary schools, the researcher’s conclusion is not very encouraging. Mathiasen’s definitions, however, are functionalist in the sense that she represents ITs\(^{53}\) as having roles which makes them more or less interesting to begin with.

Mathiasen distinguishes between tool functions, which she defines as being in line with the already known technologies contained in a conventional pencil case – only now with electricity added, and IT in what she calls a media perspective, which both relates to already familiar media like radio, television, newspapers and books, and adds new forms such as chat, mail, video conferences and homepages (Mathiasen, 2003, p. 14).

This thesis demonstrates that there are several problematic issues regarding the ways in which Mathiasen conceptualizes IT, including the:

- determination of the general qualities of the ICTs in question
- categorization of ICTs and thus also their relationship to education
- categorization into simple tool function i.e. merely matters of doing the same just with a different tool. This inserts a scaling of the issues that matter and seem interesting

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\(^{52}\) When Mathiasen uses the phrase IT use, it is a bit unclear what she is referring to. The consecutive research focuses on web-mediated forum communication – in line with the schools participating in the project – which Mathiasen calls net-disseminated asynchronous, written computer-mediated communication. I proceed from the assumption that the Mathiasen’s conclusion relates to this particular form of communication and IT use.

\(^{53}\) Mathiasen uses ‘IT’ and writes that when she does it refers to the same as ICT – including communication.
• functionalist categorizations, as Mol (2002) notes, they tend to overlook the ways in which things become transformed when associated with new instruments

Furthermore, the author does not engage with discussions of the nature of the ICTs involved in the research. ICT integration and relationships between ICTs and education are often discussed in noticeably general, categorical and taken-for-granted terms. Danish researcher Esben Fuglsang (2003) engages in a philosophical discussion about what information and communication technologies actually are. Fuglsang works with the concept computer based information technologies, which are digital technologies, and his concept involves the imaginary that sometimes computers do not make a difference (Fuglsang, E., 2003, p.425). Fuglsang refers to philosopher Martin Heidegger’s theory about the existence of things. According to Fuglsang, Heidegger distinguishes between the thing (a tool that can be used to …) and its principals (in order to …). Fuglsang makes a distinction between 1) the thing, 2) its technical principals, and 3) intentional and meaningful use (Fuglsang, E., p. 426). Furthermore, he emphasizes that in modern technologies, the thing and its principle of use becomes integrated with a technology, e.g. the skills needed to sew, becomes integrated with the sewing machine. Referring to Steen Wackerhausen, Fuglsang also emphasizes that technology has increasingly become less about the thing itself and more about the working processes related to things. Technologies embody potentials that have to be culturally actualized:

New technologies embody potentials for widespread processes of cultural change, and the same culture influences the formation of technology.

(Fuglsang, E., p. 430)

The meaning of the symbols we experience with, in and through the computer exist and is built independently of the computer. The digital information technology’s meaning is created by the surrounding reality of the space and the firsthand experiences made herein.

(ibid., p. 435)

These quotes indicate that Fuglsang views culture and technology as particular separate entities that may mutually influence each other. Technology has potential and culture (whatever that is) may embark on this potential (or not). Furthermore, Fuglsang a priori essentializes ICTs when he refers to their essence as being the digital (Fuglsang, E., 2003, p. 431). Yet, he still concludes that: “In the previous I have made the point that the digital information technology neither as a concrete tool nor a technical principal in

54 But he relates differently to Heidegger than Latour does (as will be elaborated upon later).
itself can have a change making role. Technology must be understood as an expression rather than cause of processes of change” (Fuglsang, E., p. 449).

Mathiasen and Fuglsang represent two different ways of engaging in an analysis of ICTs in relation to education that are not learning strategic. Mathiasen, in general and on the basis of her research, identifies the roles of ICTs, which then become depicted as general traits. Fuglsang calls upon a social/cultural understanding of the meaning of technologies. Despite their differences, I would claim that both researchers situate technology (which is something) in practice (which is something).

Researching ICTs as practice – approaching a variation of praxiography

Recently, researchers (e.g. Bundsgaard, 2005 & Henriksen, 2003) have discussed the problem that media researchers and information system development researchers apparently use monolithic terms like media and technology in general and thus unclear ways, which makes it difficult to understand what the terms actually refer to. Information systems development (ISD) researcher Dixi Louise Henriksen (2003), as already mentioned, discusses the curious case of the vanishing artifact. Over the last two decades there has been an increasing focus on ethnographic approaches (both Drotner et al., 1996 & Holm Sørensen & Olesen, 2000 mention this) for studying media and technologies as participants in everyday living and practices (Hine, 2000; Holm Sørensen & Olesen, 2000; & Baym, 2000 are examples of this). Drawing on STS studies, Henriksen argues that there is a need to start studying technologies as practice or enactments rather than as tools or media in practice. While technologies as practice assumes that technologies become technologies inside different sociomaterial entanglements, the latter assumes (more or less – and of course too simplistically put) that technologies are objects which enter cultural practices and are thus imagined as somehow existing prior to them as more or less stable entities with fixed definable properties and identities. In keeping with Henriksen, Danish researchers Sørensen (2005) and Bruun Jensen (2004) have engaged in what Mol (2002) calls praxiographic approaches to studying ICTs as practices – enactments/events. In the following analyses of the ways in which the Studynet becomes an actor55 engaged in various relationships and everyday ways of living related to HBC, I relate to these and other STS and ANT researchers. Rather than pursuing one or the right theoretical definition,

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55 Conceptualizing the Studynet as an actor should be understood as a way to acknowledge that the presence of the Studynet influences things, but without taking for granted either what presence may entail and what being an actor involves. Inscribing the Studynet as either media or tool carries too much weight in relation to already established taken-for-granted understandings of what may be the agencies of ICTs when being referred to as either tools or media.
position, state or explanation of things, I think of my research as explorative, performative, relationally and sociomaterially enacted. Any existence, e.g. ICTs, relationships, processes of learning, changes, education and everyday living, is here understood empirically as effect of complex movements in the ongoing fabrication of ontological compositions and their sociomaterial entanglements, i.e. as practices – enactments.

In the following I describe relationships between the Studynet and the everyday ways of living related to HBC as movements in the ongoing fabrication of ontological compositions involving both the Studynet and other actors in the everyday ways of living associated with HBC. Based on the way Danish e-learning researchers commonly engage with these matters (as will be elaborated in Chapter 5), I believe this is a different point of entry for engaging with understandings ‘of’ the generation of relationships between ICTs and education in Denmark (and maybe also internationally).

Focus in remainder of the thesis

In the rest of the thesis I examine Hillerød Business College (HBC) and present relational ways to understand the enactments of the Studynet and HBC as well as their interobjectively enacted relationships. Through the analyses, the Studynet, math, assignments, homepages, communication and other actors at HBC are described as partially coexisting phenomena that move through ongoing processes of partial associations, translations and re-orchestrations of everyday living. Overall, this approach represents a move away from imagining that it is possible once and for all to reach a point in education from which education programs are prepared, ready and tuned in with ICT. Instead, I suggest that education can be understood as existing in a continuous state of projectness, i.e. a continuous state of be-coming. Living in an Information Society means living in a world in motion (i.e. a society in formation) where things coexist in partial, momental formations as things that both partially form and become formed, partially contain and become contained. From this approach follows the acknowledgement that putting together/comparing/entangling/aligning and establishing relationships and references ‘between things’ must be viewed as inseparable aspects of any knowledge creation process, and thus this is also to be viewed as processes of enacting things/identities through movements/entanglements – in other words things are understood as in-between existences. One could say that enacting ICTs as either having roles/functions or as having potential that may culturally be embarked upon represents variations of ways in which to place ICTs as particular in-between existences that predetermine part of what constitutes the identities and agencies of ICTs. This thesis tries to engage differently with ICTs as in-between existences, in
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the sense that it does not attempt to predetermine the identities and agencies of the Studynet. Of course, in a sense, this may also be viewed as offering just another predisposition, one which insists on the identities and agencies of ICTs – and any other actor – as being relational matters, i.e. as momentary achievements. This approach implies that research and researchers, and their empirical-methodological-theoretical assemblages must also be viewed as part of what constitutes phenomena. In other words, as part of what constitutes both the problems and solutions to be worked with. This means that researchers and their workings must also be understood as part of the phenomenon.

**Merging media and ICT studies with STS studies**

According to several of the authors (The Virtual Knowledge Studio/Wouters et al., 2008; Boczkowski & Lievrouw, 2008; & Wajcman, 2008) in *The Handbook of Science and Technology Studies* (2008), merging media and ICT studies with STS studies is a recent phenomenon. Judy Wajcman (2008) characterizes this merging as part of the currently emerging technosciences. Leafing through the *International Handbook of Virtual Learning Environments* (2006) confirms that this merge is a new mix, also within e-learning research. Thus, adding STS/ANT to e-learning research is both new (and perhaps controversial) in the sense that only recently have educational researchers in Denmark (e.g. Sørensen, 2005 & Jensen, 2005) begun to gain/articulate inspiration from and engagements with STS/ANT, also in the sense that in relation to e-learning research, bringing ANT into e-learning science may be viewed as quite a new move. With respect to ANT the contributions of this thesis may be limited as I do not attempt to establish a particular (new) position within STS/ANT. This thesis may instead be viewed as taking part in adding to the already ongoing movements in STS/ANT involving emerging technosciences with an interest in educational matters and matters related to e-learning. Educational matters are not mentioned in the 2008 edition of the STS handbook. I call my approach STS/ANT inspired to emphasize that what I am doing here is to translate STS/ANT resources into ‘my field’ of research. This is not commonly found in either STS/ANT or educational research.

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56 Though other e-learning researchers (e.g. Jones, C.; Dirkinck-Holmfeld, L. & Lindström, B., 2005) have begun to show interest in STS studies as resources for “keeping technology within our focus”.

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CHAPTER 1: MOVEMENTS

MATH, INTEROBJECTIVITIES AND IN-BETWEEN AGENTIZATIONS

This chapter explores how a knowledge sharing system called the Studynet becomes part of and takes part in moving math teaching activities. Starting with an interview with a math teacher, this chapter illustrates how the Studynet is mobilized as a partially relevant and (dis-)engaging actor through processes of making it partially compatible with the shifting instruments (i.e. paper and Mathcad) and specificities ‘of’ math teaching (e.g. computer access, working with parabolas). These shifting specificities involve moving both what transports math and what it means practically to be engaging with and handling math. The chapter uses an actor-network-theory inspired approach to engage in relational illustrations of movements involved in everyday math teaching at a business college’s upper secondary school in Frederikssund, Denmark.

57 Frederikssund department.
58 Limitations: At the time of the interview with Andrew, the aim of the PhD project was to investigate how ICTs, and particularly HBC’s, new knowledge sharing system – the Studynet – became a part of everyday living in the secondary school programs. Ministerial formulations of the different contents, aims, pedagogical methods and curriculum requirements for subjects taught in HHX and how ICTs may support them are certainly important aspects of the goings-on in education with ICTs. Still, they have not been granted a central position in this thesis. Another limitation in this research is the lack of focus on the existing research on subject related ICT integration in secondary school programs. A third limitation is that at the time the empirical data was collected, I was unaware that partial (dis-)engagements would end up being central to the research. The focus was on engagements with the Studynet. Therefore, efforts were not made to explore Andrew’s teachings further, e.g. through observations and collecting teaching materials. As the interview with Andrew was an example of a situation inside which the Studynet could not become a central participant in the teaching activities, I did not further pursue the ways in which the Studynet became part of Andrew and ‘his’ students’ everyday ways of living. The limitations of this research should be partially understood in relation to the objects of research, which shifted several times. In this thesis I pursue the heterogeneous partial realizations of the Studynet as an actor in everyday living associated with the secondary school programs at HBC. The empirical material could also have been collated and organized differently.
The chapter concludes by suggesting that variations of relevance, (dis-)engagements and partial (dis-)connections exist inside the moving specificities of ICT integration and that this may be a methodological key to understanding the ways in which the Studynet becomes part of and takes part in moving everyday ways of living related to HBC.

Understanding the space-timings of things and their agencies

Actor-network-theory (ANT) takes its point of departure in a relational approach, and has been called a material semiotic (Elgaard Jensen, 2005). Moser and Law explain relationality as: “… the claim that everything – people, subjectivities, actions, scientific facts, technological artefacts, texts and symbols – achieve their form as a result of the network of relations in which they are located” (Moser & Law, 2003, p. 2).

In ANT things are always viewed as complicated assemblages of both human-non-human and material-immaterial actors. Thus, ANT does not distinguish between (human) actors and (natural) things. The key to actor-network-theory is found in a sociomaterial relational realism. Latour (1999) writes: “… essence is existence and existence is action.” (Latour, 1999, p. 179).

For Latour, existence is action, and as researchers we should therefore continue to be curious and uncertain about existences. Existences should always, in this sense, be understood as events (Latour, 2005, p. 45). In actor-network-theory no-thing autonomously, automatically or naturally mediates something else. Things are viewed as momentary effects, and agencies are understood as distributed across multiple heterogeneous actors. Thus, any agency can be viewed as what I call an agentization, which is an active noun for the momentary end result of having made agency – to be an agent and have agency is the result of processes of agentizations.

ANT approaches different forms of existence as relative to the sociomaterial relationships in which they become engaged. Viewed in relation to its sociomaterial entanglements, a research object in Annemarie Mol’s (2002) words can be considered ontologically multiple. One of Latour’s (1999) often cited examples is the gun example, where he argues that neither gun nor man autonomously makes a shooter, but gun+man may translate into gunman or mangun, which is something other than gun (as body) and man (as body). Neither gun nor man kills, but a gunman may. Latour’s point is that things always become things inside chains of associations. Thus, ANT sets out to study these chains of associations as processes of mobilizing things through translations. Things are understood as actors by Latour, and actors are always to be understood as actor-networks (Latour, 2005). To Latour, actor-networks are not forms to study with,
but forms to be studied (ibid., p. 131), and causes in ANT are substituted with actor-networks (ibid., p. 59).

Any phenomenon we may try to generate knowledge in relation to must always be understood as already entangled with different chains of associations that make things *things*. Latour refers to Heidegger’s concept of *Ding*.

As every reader of Heidegger knows, or as every glance at the English dictionary under the heading “Thing” will certify, the old word “Thing” or “Ding” designated originally a certain type of archaic assembly … Many parliaments in Nordic and Saxon nations still activate the old root of this etymology: Norwegian congressmen assemble in the Storting; Icelandic deputies … in the Althing; … Isle of Man seniors used to gather around the Ting; …the German landscape is dotted with Thingstatten and you can see in many places the circles of stones where the Thing used to stand … Thus, long before designating an object thrown out of the political sphere and standing there objectively and independently, the Ding or Thing has for many centuries meant the issue that brings people together because it divides them. The same etymology lies dormant in the Latin res, the Greek aitia, and the French or Italian cause. Even the Russian soviet still dreams of bridges and churches.

(Latour, 2005a – references omitted)

In order to figure things out, we have to engage in making relationships through representations – gatherings. Any representation is a representation (Latour, 2005a). In Latour’s sense, representations imply ways to gather, *where* to gather, *when* to gather, *what* to gather and *who* to gather. This also means that things gather/become gathered through ways to partially assemble, disassemble and disassemble (Latour, 2005a). Things – in other words – are understood as partially existing (Latour, 1999 & Bruun Jensen, 2004b) through partial connections (Strathern, 2004).

Latour (1997) discusses the difference between focusing on time-space and space-time relationships. In the first instance, Latour depicts a train traveler moving with hardly any effort at great speed from place to place in a short amount of time. Another traveler traveling the same distance is depicted by Latour as a slow traveler who needs to make his or her way by doing hard work along the way. There is no clear path. He has to cut down trees and build roads. All this work has to be done before the other train traveler can simply sit down comfortably on a train and move rapidly from place to place. Latour’s image of the two travelers (the first is the time-place traveler and the second the space-time traveler) can be related to his concepts of intermediaries and mediators. When the road is already there, then things may appear as intermediaries. When the road remains to be built, then things become mediators, i.e. things that come into existence during processes of mobilizations. The first depiction of a fast time-place traveler is Latour’s image of the type of researchers who are already familiar with part
of the road they are headed down. The other space-time traveler represents Latour’s image of the kind of researchers who slow-cioologically (Latour, 2005), with sweat on their brows, go through great trials to accomplish things.

Another point can be ‘drawn’ from Latour’s tale of the travelers. He presents the time-place traveler as the objective time traveler, while the other one is the subjective time traveler. One could of course object to Latour enacting (as he often does – intentionally, I believe) a dichotomous splitting between two contradicting forms of traveling/practicing research. I understand Latour’s writings as practicing ‘what he preaches’, and I take his tale as an example of two coexisting and mutually inclusive practices in the living world. We cannot avoid working/engaging with and enacting in one way or another both intermediaries and mediators. Latour depicts the travelers as twin travelers. In his tale, apart from both being depicted as actors, they travel the same ground – though enacted in a variety of spatio-temporal ways. The time-place traveler does not age a bit while the space-time traveler ages. This is Latour’s analogy for the difference between imaginaries of transportation/transfer without and as transformation.

I use Latour’s tales as an illustration of what it means to choose a relational approach to analyzing the processes during which the Studynet becomes an actor in everyday living. The Studynet exists in the midst of things (Latour, 2005), and it may be acknowledged as a simple intermediary for the transportation of things; it can, however, also be understood as a complicated mediator that transforms things (but not autonomously). Latour uses trains (see also 1996a) to make a central point: In order for technologies/trains to work as vehicles for the transportation of things (meaning they appear to have agencies), a machinery of things has to be organized, distributed and coordinated (Mol, 2002). Latour’s point is the key for engaging in the following analyses.

**Research information**

On April 26, 2005, Mikala (a researcher) travels by train to Hillerød Business College’s (HBC) upper secondary school, which is located in Frederikssund, Denmark, for the first time. The visit involves a meeting with the math teacher, Andrew, who has volunteered to participate in an interview about the ways in which information and communication technologies (ICTs) take part in his everyday ways of living that are related and unrelated to his job as a teacher. The interview is part of Mikala’s PhD research, which probes the question: How does a knowledge sharing system – called the Studynet – become part of and take part in moving the everyday ways of living associated with the secondary school programs at a Danish business college? One of
the concerns of the interview is therefore the ways in which HBC’s new knowledge sharing system the Studynet has become a part (if it has) of Andrew’s teaching engagements.

Before traveling to the ‘locations’ where Andrew’s teaching activities take place, Mikala and Andrew met on several occasions at monthly meetings in HBC’s E-learning Group. These meetings took place at HBC’s ‘other’ upper secondary school, which is located in Hillerød. In relation to the meetings in the E-learning Group, Andrew explained that he uses the computer program Mathcad in his teaching activities. According to Andrew he is quite dedicated to using ICT as part of his teaching activities compared to the other math teachers at HBC. This dedication, however, also influences his opportunities for engaging with the school’s new knowledge sharing system. Mathcad and the Studynet, as it turns out, are not compatible technologies. In this sense, Andrew’s engagements with Mathcad partially exclude him from engaging with the Studynet as the point of departure for handling assignments – at least when they involve Mathcad. This is one example of the specific ways in which the Studynet becomes partially (dis-)engaged in the activities relating to the everyday ways of living at HBC. With regard to the specificities of Andrew’s teaching activities, the Studynet may become partially excluded from engagement with them. As this chapter illustrates, the Studynet moves and can be described as being in transformation inside the shifting entanglements of everyday living. The Studynet circulates and becomes translated inside different arrangements of everyday living. The meeting with Andrew at the Frederikssund department is one of the researcher’s many ways of moving the contexts of engagements and knowledge for understanding the Studynet as an actor in everyday living. It is one way to engage in understanding the Studynet’s different forms of (dis-)appearances as a partially existing object (Latour, 1999 & Bruun Jensen, 2004b) in relation to everyday living.

First story: Circumstances

Andrew: We’ve been experiencing quite a few technical problems with the Studynet. It has been difficult to get it up to speed. At certain times we haven’t been able to use it. It’s quite essential in order to make it work. If there are even a few days where it doesn’t work then you cannot give the students access to homework. It really breaks the rhythm.
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Mikala: Has this been a particular problem in your school [in Frederikssund]?\(^{59}\)

Andrew: Yes, we’ve had some trouble with the Internet connection at Hillerød. This has meant that sometimes the Studynet would be extremely slow. It takes several minutes to log-on. Then it just doesn’t work. But this has been a particular problem for us, and we have of course also experienced the ordinary problems mentioned in the E-learning Group.

In the beginning of the 2004-2005 school year, Hillerød Business College introduced the Studynet to teachers, leaders and students. According to the annual satisfaction survey conducted by HBC in fall of 2004, many students from the Frederikssund school experience connectivity issues and 26% cannot access the Studynet from home. Some students indicate that they do not have a computer while others have no Internet connection or one that is too slow. In addition, some students write that they do not have Internet access because they have moved away from home. The figures vary greatly from class to class and from program to program. In Frederikssund in the basic vocational classes, 20-50% of the students cannot access the Studynet from home, while in the HHX classes, 9-33% of the students cannot access the Studynet from home. These circumstances, as Andrew explains, are crucial for the level of the teachers’ engagements with the Studynet as an actor in teaching activities. Other than connectivity and access problems, there have also been quite a few technical problems with the students’ access to their Outlook e-mail and schedules via the Studynet. This has also influenced the ways in which the Studynet has become an actor in the everyday activities at HBC.

Another issue is that Andrew uses Mathcad as a central teaching instrument in his math teaching and it is not compatible with the Studynet.

Andrew: As I mentioned to you yesterday [at the E-learning Group meeting], I have the problem that the math programs we use are not Microsoft’s. This makes it very difficult to use it [the Studynet] for handling assignments. Mathcad … I have to separate it from the Studynet. It cannot be properly integrated. So that’s why students hand in their assignments on paper.

It becomes too difficult to open a file. You have to save it on the desktop first, and then you can’t use the proofreading and correction features. Even if Mathcad can be copied into Word, it works as a picture where you can’t just add comments as needed like you can in a Word document. This means you have to print it out and do the corrections by hand. I think it’s doubtful whether they’ll ever be integrated, so

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\(^{59}\) This information assists the reader in understanding what the momentary frame of reference in these conversation extracts is. In conversations/interviews, statements are made with reference to occurrences or ideas that are not made explicit because they are a given for the participants. It is only from having been present that these references make sense ‘in-themselves’. This is true in the example below in which Andrew refers to something that happened yesterday and I know that it refers to the E-learning Group meeting, information the reader is not privy to.
Several circumstances influence the ways in which Andrew engages the Studynet in math activities. In April 2005 when Andrew gives Mikala a guided tour around the school campus, he describes it as not having developed over the last thirty years. The physical backdrop of the Frederikssund school has not changed radically, according to Andrew. They have a very small room (approx. 6 m²) with four computers for teachers to work on with Internet access. There is a computer room. There are no computers, no wireless Internet access, no Internet access or video projectors in any of the classrooms or in corridors. Andrew describes activities involving a video projector as requiring too much work because it involves going to get the equipment on a cart and wheeling it to the classroom in order to set it up. It is a tiresome process requiring too much time and effort.

The materialities of this department appear very different from the upper secondary school in Hillerød located on the street called Trollesminde Allé. They have wireless Internet access in most places at the school, numerous corridors with computers available for the students, and video projectors were currently being installed in most classrooms. The materialities of the Frederikssund school as well as the lack of student and teacher access to IT from home are conditions that influence the ways in which Andrew organizes his math teaching and engages ICTs in his activities. Inside these specificities of Andrew’s math teaching, computers and the Internet are available for one-third of the lessons but the teachers and the students have to go to the computer room. Thus, not surprisingly, in this moment a lot of the engagements with ICTs involved in Andrew’s classes must currently take place either during these lessons in the computer room or outside of class as part of Andrew’s teaching preparations, student homework activities and Andrew’s out-of-school communication with students.

Even though these are the circumstances, Andrew still describes himself as a teacher who actively engages ICTs in his teaching activities, and HBC’s head of quality and communication also refers to him as a dedicated pioneer in relation to ICT integration.

Andrew: In relation to the other math teachers, I have made all the materials myself for the first year – A and B level. All these assignments and theory can be found on the Studynet as Word documents. This way students always have the theory and their assignments within reach. I don’t dare, however, to only upload and store the materials electronically. They have also received the materials on paper. This hangs together with the fact that we also have quite a few math lessons in our ordinary
Andrew is engaging the Studynet in his teaching activities in a way that makes it possible to carry on activities even when they experience connectivity issues and other technical problems. For quite practical reasons Andrew makes sure that students have access to the necessary materials without having to access the Studynet first. Even if they were not experiencing technical problems, too many students do not have access to the Studynet from home, and they do not have the facilities at school for every student to access the Studynet during school hours either. They have dedicated time with computers and the Internet in the computer room.

Mikala: How does it work when you’re working with Mathcad and you don’t have the computers all the time?
Andrew: It means that the subject is divided into two parts. This, however, is not that bad; actually, for example, things like drawing graphs move like lightning when using a program like Mathcad. If you suddenly work on paper and need to draw a parabola then other problems appear that you weren’t even aware of before when you were just drawing in Mathcad. Also, different things related to ways of understanding surface, for example, if you haven’t really understood what a square root is, that it becomes something positive … -2 times -2 becomes +4. These are the kinds of things which they often don’t know when they come from primary school. If all you have to do is to draw, then you might not discover this. But sometimes when they work with pencil and paper, it becomes articulated. We also need to remember the oral dimension of the subject. It’s excellent that we also have some time for training the oral dimension. You don’t manage to do that when you sit at a computer. At all! The new reform also means that the written exam is split in two, one part with aids and one without. Without aids means that students need to be able to solve mathematical problems without a calculator, etc. So we have to practice that as well. You can debate whether it’s a good structure, but it’s a requirement formulated by the ministry that upper secondary school programs must be more alike, hence exams without aids.

The interview with Andrew illustrates that movements in math are related to manifold movements that coexist interobjectively and become mutually included in each other. i.e. new education reforms, shifting instruments of teaching and their momentary availabilities, and shifting ways of arranging teaching. While engaging the Studynet and Mathcad certainly influences math teaching, the momentary specificities of math teaching (e.g. that one-third of the lessons take place in ordinary classrooms) also influences the engagements with the Studynet and Mathcad. New technologies understood as actors come into existence through sociomaterial relationships and engagements. New technologies take part in changing relationships and engagements, but only partially. Not all relationships and engagements become changed, and the Studynet ‘only’ partially participates. Both the Studynet and Mathcad come into being
as technologies in education that must engage with many processes of translations relating to a new educational reform, examination requirements, the IT ‘infrastructure’ at the Frederikssund school, and the availabilities of ICTs in everyday living both relating to the Frederikssund school and to students and teachers. In other words, many human and non-human actors take part in the (dis-)engagements and processes of translations relating to the integration of Mathcad and the Studynet in everyday math teaching.

Andrew explains that handling different instruments (not just ICTs) alters the different agencies involved in doing math. Thus, it is not necessarily a problem that most of the math lessons revolve around classroom and face-to-face teaching activities, and furthermore that numerous activities are still paper based. Instead, these circumstances take part in making other possibilities for engagements available. Furthermore, in spite of the circumstances, Andrew uses ICTs all the time. Most of his preparations for class are done with ICTs. However, while ICTs take part in his everyday activities, it may not be the same in the case of the students’ engagements with math. Mostly they are positioned in class and work with paper, which means that most of their engagements and relationships with math (in school) involve paper and written work on paper.

Doing math is many different but coexisting things. When pupils study and teachers teach, they do math. Math teaching events are entangled with math study events. But while ICTs may take part in math teaching events, it does not necessarily involve ICTs in the same ways as study events. Math teaching with ICTs (e.g. in relation to structuring and planning assignments) partially does, however, also change what it means to engage with math assignments on paper. Furthermore, the workings before, after, and outside class, may involve ICTs, but since ICTs are not always available in classrooms, what happens in class may be without the immediate presence of ICT – though ICTs still play an important part in the class, i.e. in Andrew’s design of teaching materials, formulations of theory and structuring of teaching activities.

Second story: Doing math

Mikala: Can you tell me a bit more about the ways in which you include IT in your teaching?
Andrew: I primarily use Mathcad. I use Excel a little. Especially when engaging with amortization plans, for example, when calculating and making a list of the development of loans. Amortization plans illustrate the development of the loan with interest. Excel is a splendid tool for solving these kinds of problems. But in relation to ordinary math we use Mathcad. Having this program opens up new possibilities. Before we used to describe parabolas with text, now I can ask first-year students to try it in Mathcad, and then ask them to use their investigations to explain what makes the parabola move. You could do that on paper, but it would take three
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weeks. Then they’d have to draw five or six parabolas where they’d have to change the values. It would be rather impossible. The availability of this program means that they can independently figure out how it hangs together. It is a radically different way to approach things in comparison to how it is traditionally done. It’s a way that becomes possible due to this kind of program …

I used to ask them to draw parabolas and explain the meaning of constants in relation to them. For many students it is a difficult task to formulate it precisely in words. In math things need to be squarely put. It is often difficult and it requires practice. You can do it with other things as well. Let them explore things themselves. What happens when? How will it look? …

We also use word processing for some types of assignments of course … if you need to do fractions or something like that, then Word is not suitable. Then you need an extra little program called Equation. But it is one of those insert-object programs and then there are these equation fractions. You really need to be experienced otherwise it takes you a half an hour to write one formula. Everything works differently in this program; when you have to make a space, the space key doesn’t work with a single touch, you have to push both Ctrl and space … and a lot of weird stuff. I show students this option, but most of them give up writing formulas nicely using this, because they find it too problematic.

Mikala: How about Mathcad? Can’t they use Mathcad to do the assignments?
Andrew: Yes, yes, they can write texts there as well, and it is a much easier tool for writing formulas than Word. In Mathcad things are fine.
Mikala: Don’t they have access to Mathcad at home?
Andrew: Yes, exactly, we have acquired a school agreement license … ordinary word processing is used for making different types of assignments, more open assignments.

Andrew comments that teaching and learning the same topic such as parabolas with Mathcad is radically different compared to working on paper. Furthermore, new ways of understanding open up inside (in-between) these relationships and in the movements between Mathcad and paper. However, the interview also illustrates that these qualities are not to be viewed as properties of either the program or the paper.

When Andrew describes his ways of teaching and engaging students in math, the examples he provides illustrate how multiple translations of math and many other relationships become involved not only when engaging with a variety of ICTs but with a variety of teaching materials, ways to teach, understand and work with the same subject i.e. parabolas. When the instruments change the engagements in math, the ways of doing and becoming knowledgeable about math also change. Rather than solving problems via Mathcad as something ‘other’ (a better substitute) compared to solving problems on paper, the two engagements can be understood as providing different but partially supplementary contexts for working with parabolas. Engagements with
parabolas with Mathcad, and with paper and pencil coexist as different variations of parabolas, i.e. different enactments (Mol, 2002).

**Moving engagements, agencies and competencies**

If we think in terms of continuous alterations of the instruments and materialities associated with what it means to handle the educational program associated with HBC then competencies are not things, i.e. knowledge that individuals possess, acquire and apply. Competencies are not something individuals have (Latour, 1998a). Competencies are distributed across sociomaterial arrangements and come into being in relation to the different partial engagements made and relationships enacted when working within their specificities. The Mathcad and Studynet features partially emerge within the specificities of the arrangements inside which they become partially (dis-)engaged. Thus, the competencies needed must also be viewed as partially emerging inside these relationships as well. As the example with Mathcad and parabolas shows, inside these specific entanglements Mathcad becomes agentized in ways that alter the competencies that both students and teacher need. Furthermore, student and teacher competencies coexist as part of mutually inclusive and yet different arrangements of things. On paper, the competency to explain the parabola is present while the illustration of the parabola may be absent. In Mathcad the illustration of the parabola (visualization) may be present while the explanation of its different coherences may be absent. Thus, doing math and the competencies related to doing math changes with the different instruments. Moving between instruments involves also moving between different agentizations of teachers and students.

**Third story: Assignments**

Andrew explains how he moves between different materialities of math teaching in relation to the subjects he teaches, e.g. in relation to a Christmas project he handed out long pieces of paper to the students and asked them to make frames and then study what happens to the area when the sides are made longer and narrower. The students had three lessons.

Andrew: The assignments I received ranged from a half a page to twenty pages long in Word. How the students work with this kind of assignment varies. Some get terrified. A couple of girls who usually do meticulously neat assignments were almost crying while asking what they should do. Other students got carried away and asked: “Can we do this? Can we write about this?”

Mikala: So it provides different challenges and options that a variety of students experienced differently.

Andrew: Yes, so it’s related to more than just information technology. They also have very different IT skills. They are not required to use IT for the assignment, and
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it doesn’t have to look a particular way. So they worked very differently on this assignment, and the results were differed greatly ... With the new reform, students must do written assignments on a specific topic, for example, one about second degree functions, and then they work on an assignment they receive electronically, and later, when they learn about differential calculus, they can build upon the second degree functions assignment. Then you add something about differential coefficients on to this too. Over the course of three years, you end up with a rather large number of topics that the exam can cover. I think it’s going to be exciting.

But correcting the assignments will also mean a large amount of work, and the assignments require more work. We get fewer hours of work allocated to correcting assignments now, though *laughing*.

Moving (dis-)engagements and forms of assignments

Andrew explains how different math instruments come into existence in a variety of relationships with students. Instruments do not just engage students in the same ways. Andrew refers to an example with two girls who are usually very committed to order and structure. They find it difficult to engage with assignments that involve a more open and loosely defined structure. Other students, however, get highly motivated and carried away by these assignments.

The space-timings of teaching involve different spaces for written and oral articulations and engagements. The challenges and options related to assignments also relate to the instruments at hand and the human actors engaging in the activities. Changing instruments can thus also take part in moving the form of an assignment and students’ engagements. Assignments and student work may become differently structured and differently open. This means that working with a subject becomes different things. In one instance a subject may appear structured and ordered, i.e. something rule based to be solved and nicely presented. In another instance a subject may become messy and difficult to handle, i.e. unclear, and something to be studied and the rules analyzed.

Fourth story: Partial (dis-)connections

Mikala: How about Outlook and e-mail?
Andrew: I encourage students to e-mail me. I mention this rather often, but not many do it. I also ask them to send me an e-mail if they are working at home with assignments. I’m usually pretty quick about reading and answering e-mails. A few use it, but surprisingly few.
Mikala: Do you use IT for handing in assignments?
Andrew: Not consistently. We actually use paper the most, so far. For the assignments on a specific topic, I think that it’ll be important to make it a habit to hand in assignments electronically, otherwise there will simply be too much paper. If it needs to be handed in five times in the course of ... At that time it will be
important, but not now. Presently, it’s about maybe one question and assignment a week.

Mikala: Are face-to-face lessons still the basis for what happens?
Andrew: Yes … I use IT all the time. Also because I make everything I do electronically available for the students as well. For my teaching, it is maybe one-third of the lessons that take place in the computer room. But I use IT all the time when I produce the things I make. It would be difficult to do it without IT.

Mikala: How about Internet searches?
Andrew: Yes, I actually use that quite a lot, for example, for the different math programs I try to find new related things. I also search generally to see if I can find math-related topics and assignments.

Andrew primarily uses ICTs as ways to engage in teaching math subjects. The activities are based on face-to-face meetings at school. Even though Andrew states that surprisingly few students choose to ask questions about assignments via e-mail, this may relate to the everyday circumstances and arrangements of the math activities. They leave a certain space for using computers and the Internet available. Even though Andrew clearly engages ICTs actively in the everyday courses of math activities, inside these entanglements it makes sense that assignments are mostly handed in on paper, and that Internet searches are chiefly a means for Andrew to find additional resources and inspiration for his teaching activities.

Moving entanglements and partial connections

Hansbøl (2002) shows how participation in a computer math class working with Mathcad altered upper secondary school students’ competencies and hence influenced their possibilities for participation in other subjects, for example, in chemistry where computers and Mathcad were not always available to make graphs. These relationships might, of course, be different today, but they illustrate the point that not only does the change in instruments alter the technologies of doing math, but it also changes the relationships and engagements with math in other circumstances. It is not to be understood as an effect of a technology like Mathcad, but rather that – as Latour (1991) suggests – when altering an actor in an assemblage of actors, i.e. by adding Mathcad to arrangements of math, all associations related to this hybrid become partially translated, too. Associations also relate to partial engagements with other actors i.e. chemistry. This is not a matter of simple causal, determinist or mutually constitutive and transitive relations between two or more autonomous ‘bodies’ like Mathcad and chemistry. It is a matter of partially coexisting actors and connections, and it may be only in relation to doing a graph that the relationships between math, chemistry and students move. This example illustrates that competencies move and become resituated in the sense that they co-evolve and move through translations with the specificities of the emerging space-timings of things, their entanglements and partial connections.
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Moving space-timings, processes of instrumentalizations and functionings

The agencies and qualities of the instruments differ and may be viewed as relative to their location. Moving between instruments of math teaching involves moving between agencies of the teaching materials, the students and the teacher. Something delegated to the teaching material on paper may not become delegated to the teaching material in Mathcad and vice versa. But each instrument of teaching as well as combinations of these (i.e. paper and Mathcad) also gain their own space-timings, partially in relation to the specificities of the teaching circumstances. Since these specificities are on the move, it may be appropriate to talk about the ongoing processes of remobilizing and reinstrumentalizing different resources, i.e. paper, the Studynet and Mathcad as actors in the everyday living relating to education as processes of making functionings. When the class is being taught in the classroom with no computers and preparing for what is expected on the exams, it involves exams with and without math aids and paper is enacted as useful. In the computer room, Mathcad, Equation, Excel, Word, the Internet, etc. may become relevant actors for teaching activities. When preparing and structuring teaching materials and assignments, the Studynet may become a relevant actor. Sometimes Word and Equation become relevant instruments when the students engage in math assignments. ICTs and other resources that may be enacted as instruments for teaching and education are not generally relevant for everyone, everywhere, anytime.

Ongoing processes of mobilizations and ontological multiplicities

Being at HBC at exactly this time with all the different challenges being faced provides sources for studying different kinds of entanglements, relationships, (dis-)engagements and movements that become involved when introducing the Studynet as an actor in the everyday ways of living associated with education. Studying ICTs as becoming actors through everyday efforts and entanglements with the specificities of momentary sociomaterial circumstances relating to the ongoing processes of mobilizing the materialities in education also suggests that becoming an actor means engaging in a continuous state of projectness. Math is in a sense a somewhat stable teaching subject. Following how the Studynet becomes a part of the everyday ways of handling education at HBC, however, also illustrates some of the fluidities (de Lact & Mol, 2000) of everyday living relating to math. Math changes partially because of new educational reforms and curriculum changes. But math also changes in the relationships with the ongoing movements of the ontological compositions of math teaching. Viewed this way, math becomes something continuously (but not freely) on the move. Doing math with paper is not the same as doing math with Mathcad. Both space-timings involve parabolas, but they become mobilized differently. This example illustrates how
changing the instruments of math also changes both the knowledge and ontologies associated with math. Doing parabolas has multiple forms of existence today, partially because doing parabolas may involve multiple instruments that take part in doing parabolas.

Changing instruments may change a whole range of relationships and engagements not just related to the immediate circumstances of use but to the overall entanglements of things. Both what partially transports math and the ‘stuff’ being partially transported as associated with math change (Latour, 1997).

Moving subjects and contexts of knowledge and engagements

Andrew’s teaching examples illustrate how math relationships move. Math is conventionally not considered a subject that moves in everyday living. Math is a rule-based, general and natural science. Math involves general/generalizable knowledge and practices. However, working with equations and parabolas become different things when using different instruments. Thus, changing the instruments of teaching does not just mean being able to do the same work better, easier and more effectively or in new ways that better fit with Information Society’s working, teaching and learning practices (Trilling & Hood, 1999). Teaching instruments take part in moving the contexts of knowledge and engagements, and thus also the competencies, relationships and engagements associated with subjects. In each instance qualities are added and subtracted (Latour, 1999). Often ICT integration in schools has been motivated by arguments like motivation and adding the element of variation. But the examples from Andrew’s teaching illustrate that different students may be motivated differently and that different competences and knowledge are involved, which means that variations may thus not be equally motivating and relevant for each and every student everywhere. Also, ICT integration does not simply offer another option for adding (a better) variation to otherwise more or less stable everyday teaching. Andrew’s everyday teaching exists as variations, i.e. as movements in-between ontologically multiple reorchestrations and recompositions.

It is unjust to simply claim that since ICTs are not (always) physically present in classrooms nothing is going on with ICTs. Furthermore, the claim that nothing

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60 I will refer to the Information Society throughout the thesis. Trilling and Hood use the term Knowledge Age. In English literature these societal developments are often conceptualized with the terms Information or Knowledge Society. However, other suggestions have been made such as the Hypercomplex society and the Learning society (Qvortrup, 2002), or that we are currently on the threshold of the Digital Age (i.e. Langager, 2006); while Ryberg (2007) refers to Manuel Castell’s term the Networked society, and what Etienne Wenger calls the Global Learning Economy and the century of identity.
interesting is going on, because all that is being done is simple remediation – the imaginary of merely moving assignments on paper to assignments on the computer – would be a short cut that does not take into consideration the complex relationships, amounts of work and multiple translations involved in these supposedly simple movements (transfer) of things from one situation to another.

**Shifting ontological compositions and reconfigurations**

In Andrew’s teaching activities the introduction of ICTs is not a matter of moving from ‘the old’ to ‘the new’ ways of teaching. Rather, the movements involved in associating the Studynet with the math activities should be understood as related to the continuously new configurations and entanglements relating to moving space-timings and ongoing processes of objectifications ‘of’ math in everyday living.

In this setting, involving ICTs as actors in math is not a matter of getting rid of the old conventional (industrial) forms of teaching and entering the new Digital Era. No general/singular old form of teaching exists to get rid of and no general/singular new one exists to engage with. Math and its multiple contexts of knowledge and engagements are continuously being reworked in relation to many different movements of everyday living. Math does not exist as such as knowledge ‘out there’ to simply be transmitted by the appropriate means. Math and its different contexts of knowledge and engagements come into existence in relation to the different teaching materials, instruments and their relationships with everyday living.

Andrew uses a variety of resources in math as instruments for both teaching and learning math. He engages ICTs as actors in making materials, distributing materials, putting math into different formations, redesigning assignments, communicating with students, etc. One could say that Andrew’s ways of organizing instruction partially constitutes construction sites (Latour, 2005) for redoing and reengaging with math.

**Moving understandings and conceptualizations in-between**

Andrew’s examples illustrate many important aspects of what it means to move between instruments of everyday living. Changing instruments means changing contexts of knowledge, engagements and competencies. But we may also draw a different but central argument from the interview. We might consider that it is not inside different events that things become things, but rather as Latour and Hermant (2006) suggest, that it is in the movements between entanglements that things become partially visible and gain their agencies. In other words, when students work in different ways
with parabolas it may improve their chances for understanding parabolas. Articulation, as Moser and Law (2003) also point out, exists inside sociomaterial entanglements on the move, and not inside things in themselves. Thus, movements between instruments may actually be a substantial actor in engaging as well as articulating knowledge and processes of learning. Another central issue is that each arrangement involves partial articulations. Not everything is presented inside arrangements, and movements between arrangements also imply movements between partial articulations. Particular knowledge i.e. about parabolas comes into existence through partial engagements with ontologically multiple, different events that may connect with many different spacings, timings and agentizations ‘of’ things. In Andrew’s teaching, ways of understanding, conceptualizing, as well as abilities to handle things move through variations of partial engagements and the ways in which they become partially connected.

Variations of relevance, (dis-)engagements and partial (dis-)connections

Mathcad and the Studynet do not ‘technically’ interoperate, and this means, according to Andrew, that it is necessary to separate teaching activities involving Mathcad and the Studynet. Many different variations of ICTs exist in the everyday living related to HBC, and they are not all technically compatible. But being technically incompatible with Mathcad does not necessarily make either Mathcad or the Studynet bad or inappropriate technologies. Furthermore, this does not determine whether Mathcad and the Studynet may both become actors in math teaching. Instead, at issue here, are variations of relevance, (dis-)engagements and partial (dis-)connections. This suggests that the imaginary that any one of these math actors (paper, Equation, Mathcad, the Studynet, Word, Excel) should/could be the context/platform of activities is unrealistic. Instead, it seems more realistic to talk about making partial connections (Strathern, 2004) with and involving heterogeneous actors partially in the shifting ontologically multiple compositionings of everyday math teaching.

The interview with Andrew implies that in order to understand the ways in which the Studynet becomes a part of the everyday living relating to HBC, one must investigate the different partial ways in which the Studynet becomes compatible with the ontologically multiple and heterogeneously assembled everyday living relating to HBC. This means acknowledging that variations of relevance, (dis-)engagements and partial (dis-)connections exist inside moving specificities of ICT integration and that this may be a methodological key to understanding the ways in which ICTs – in this case the Studynet – become part of and take part in moving everyday living related to education.
Potential criticisms

At this point, readers may object and say that the results (conclusions) of this chapter are not surprising. They may see it as a problem that this chapter introduces actor-network-theory, and not surprisingly, ends up referring to things as momentary results of working nets of actors. Latour (2005) criticizes sociological theories for explaining the social with the social. My response to this potential (and relevant) critique is that this is a partial result of the process of writing. In reality, actor-network-theory was incorporated after the collection of empirical data. So far, the resources I have found to best engage with representations of this research ‘come from’ ANT literature. ANT does not provide a theory of the connectedness of things. I understand ANT as providing methodological tools for engaging in analyses and descriptions of variations of theories and other forms of enactments of the hanging togethernesses of things. So far, I have engaged in one description of the forms of enactments and hanging togethernesses of things related to HBC. Other variations coexist and will be engaged with in the following chapters.
CHAPTER 2: MOVEMENTS

WORKING PLATFORMS OR PLATFORMATIONS AT WORK?

This chapter explores how the introduction of the Studynet as a platform for things becomes part of and takes part in moving the initial engagements with the Studynet. The introduction of the Studynet at Hillerød Business College was based on the Studynet as the new digital context for engagements in activities. This full engagement approach is problematized throughout the chapter.

The math example from the previous chapter illustrates how the emerging engagements with the Studynet indicate that the Studynet is in fact not being generally realized as the point of departure of things. The engagements with the Studynet are better described as partial engagements. The specificities of the shifting situations inside which the Studynet becomes engaged vary, and so too do the points of departure – the formations of the plateau – for engaging with the Studynet.

To begin with, the imaginary of the Studynet as the platform for things takes part in the fabrication of the evolving activities and engagements with the Studynet. This is, for example, expressed in the attempts made to control teacher and student use of the Studynet, i.e. by closing student access to Hotmail when in school, and by disconnecting teachers’ homepages.

The chapter discuss these movements as ways to partially (uni-)direct, generalize and foundationalize engagements with the Studynet. This approach is presented as problematic because it ignores the moving specificities involved in making the Studynet compatible with the variations of everyday activities associated with HBC. In conclusion, one suggestion is to move the focus from the Studynet as an autonomous object – a platform with qualities entering practices – to the Studynet as emerging practices or platformations. It is argued that a variety of points of departure for engagement in the Studynet move the positionings of the Studynet in multiple directions. Thus, inside the moving specificities of ICT integration, the variety of directions and partial (dis-)engagements and (dis-)connections coexist with them. This may be another methodological key for understanding the ways in which the Studynet becomes part of and takes part in moving the everyday activities associated with HBC.
First story: From technology to pedagogy?

Moving IT platforms

In the article *Can we (finally) get the technology to support the pedagogy?* (Wulff, 2004), HBC’s head of quality and communication – I will call him John – describes how a school may work with dedication towards the integration of e-learning and ICTs, but circumstances beyond the control of the school may contribute to stalling the actualization of movements intended and strived for. Before the summer vacation in 2003, a group of vocational colleges were excited. According to their learning management system (LMS) provider, they were now approaching new and better times. Then, at the beginning of the 2003-2004 school year, HBC and fifteen other vocational colleges received an e-mail stating that their LMS provider was put under administration (ibid., 2004). These schools were involved in a strategic network consisting of schools engaging with the same ICT platform. At the time of the company’s failure, HBC had already spent more than a year and substantial resources taking part in adjusting and correcting a technology which was never put to use. Facing the failure, HBC and the other schools now needed to look for another ICT provider, and once more engage in the processes of getting entangled with ICT providers and the construction of a new complicated technology for educational purposes.

This new situation, however, also called for a new approach. HBC had previously engaged with several systems which meant that the users had to log on to the e-learning net (LMS) with one login and password, and on to the school intranet with another. The new challenges provided HBC with the opportunity to look for a software provider that offered product integration in order to enable interoperabilities between systems. The technical school network established a new steering committee (that included John) that entered into a dialog with Microsoft Denmark. Microsoft’s newly introduced SharePoint Portal Server was a product based on Microsoft’s .Net (dotNET)

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61 Wulff refers to the first school intranet as the system HBC previously used for knowledge sharing and content management: “The intranet can deliver, gather and archive information and fulfill our strategies for knowledge sharing” (Wulff, 2004). The new combined intranet and LMS solution makes it possible to “read news, find team meeting summaries, upload assignments and distribute homework, access the handbook of exams, view the calendar, work with e-mail, hand in written assignments, make online courses, view grades and absences, search for information, book the video projector, etc” (Wulff, 2004). The article does not clearly differentiate which activities apply to the school intranet and which ones apply to LMS.


framework, which is a programing model aimed at supporting, for example, interoperability and product integration. After talking with Microsoft Denmark, Novo Nordic IT (NNIT) was appointed as the right partner to engage in the task of developing an integrated knowledge sharing and learning management solution especially suited for vocational colleges as well as integration with their administrative EASY systems.  

HBC became the primary pilot school participating in the development of the new NNIT solution, called the DDU.Net, targeted at vocational colleges.  

Moving between localizations and standardizations

One day, during a conversation in the hall, John explains that engaging with standard technologies adds both strengths and weaknesses. Working with standard ICTs, according to John, means engaging with technologies that more easily communicate with other standard ICTs; engaging with standard ICTs, however, also means limiting the options for making particularly local entanglements – localizations – available. On several occasions in hallway conversations, John and Jason (the head of IT support at HBC) explain that in the local development of ICT systems by vocational colleges the issue of ICT systems becoming so specialized that it left little room for automations was of great concern. Thus, previously, most of the IT support staff’s time was spent on fixing problems and doing only a little bit of development. Both John and Jason agree that the time should be spent on pedagogical developments rather than technical hairsplitting. Locally developed ICTs, based on their experience, continuously face problems with interoperability with other ICTs. Locally developed solutions, however, are better suited for engaging with local needs for adjustments and the personalization of e.g. functionalities. John and Jason describe the options for making local adjustments as altered when engaging in standard ICTs. This is a dilemma that schools need to handle: Either they are faced with the challenge of engaging with standard technologies not quite developed for their local circumstances, or they are struggling to develop and maintain locally relevant and resource demanding ICT solutions that usually end up having difficulties communicating and interoperating with other ICT actors. Each option has its costs.

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64 For more information about EASY systems, see: http://www.uni-c.dk/produkter/administration/erhverv/index.html, accessed on March 4, 2009.

65 DDU.Net was the acronym for the Digital Educational Net (Det Digitale Uddannelsesnet).
Chapter 2: Movements

Getting the technology in place

Jason and John describe the Studynet as based on standardized technologies which, they believe, will enable them to move the focus from technology to pedagogy. As they imagine that standard technologies are easy to handle, they also believe that less energy will most likely have to be spent on the technology. However, while HBC’s previous engagements with locally designed systems were time consuming in relation to their focus on technicalities, they provided great opportunities for making entanglements with things easier. Thus, in relation to Jason and John’s considerations, the move to the Studynet seems to involve moving from a choice of localization/individualization/development and great efforts to make technology work to a choice of standardization/generalization/use and a technology that is in place and requires little work. They believe that when the technology is in place, ‘all’ they have to do is use it. This imaginary is accompanied by the imaginary that the ways in which a standardized technology may become integrated in everyday activities are most likely more or less standardizable as well. In their eyes, spreading knowledge about the new platform is what is needed. Examples of good use should be spread. And like rings in the water, the different human actors are imagined to gradually pick up the Studynet and integrate it (more or less unproblematically) in their everyday practices.

At the beginning of the 2004-2005 school year, HBC was starting to engage with their new knowledge sharing platform, which they called the Studynet. John, the head of quality and communication, and Joelle, the e-learning coordinator, arranged the formalized introduction of the Studynet to teachers and students.

John explains (Wulff, 2004) that with the new IT platform, they may have moved a step in the right direction for being able to focus on pedagogy rather than technology. The objective is to “standardize things as much as possible” and “as far as possible gather information and electronic tools in one place”.

Engagements with DDU.Net and IT companies

Engaging in solutions like the vocational college solution developed by NNIT, which they called the DDU.Net, also involves engaging with both the company (in this case Microsoft) that develops and delivers the standard technologies, and the partner company (in this case NNIT) that develops and delivers the customized vocational college solution. To begin with, the IT companies and HBC share an interest in marketing the new solution to encourage further engagements and distributions of the solution to other schools. Further distribution of the solution is what partially ensures its

66 DDU.Net was the acronym for the Digital Educational Net (Det Digitale Uddannelsesnet).
success. The more schools that commit to a solution, the more sales, and thus also resources for development, and hopefully, this takes part in warranting the sustainability of the solution as well as the (standard) technologies involved in it. Part of the argument for the choice of DDU.Net is related to the fact that big, supposedly strong, and widely acknowledged IT companies are behind the solution. Engagements with NNIT and Microsoft, according to John and Jason, provide some comfort to begin with. Especially after going through the experience of their ICT provider going broke. John explains on several occasions that HBC has no problem in acknowledging that they have “sold their souls to Microsoft”. John also acknowledges that HBC on several occasions has acted as a sales organization for NNIT. Microsoft Denmark (e.g. Microsoft Danmark, 2004), NNIT (e.g. Hansen, 2004) and HBC (e.g. Wulff, 2004) take part in marketing and thus forming the initial representations of the Studynet and DDU.Net. Newspapers and magazines also participate (e.g. Breinstrup & Skouboe, 2004) in drawing attention to HBC and their new solution as well as NNIT’s new ‘educational actor’ on the platforms market. The article, Can we (finally) get the technology to support the pedagogy?, mentioned earlier and written by John (Wulff, 2004), was also part of an invitation to a DDU.Net seminar on May 23, 2004 that was sent out to the vocational colleges where delegates from HBC, NNIT and Microsoft Denmark would present their engagements with the DDU.Net. Other vocational colleges were invited to the seminar and encouraged to participate in discussions about the solution.

At the time, the DDU.Net solution was the first ICT platform combining knowledge sharing, content management and learning management functionalities to be marketed and especially targeted at vocational colleges in Denmark.

Second story: Launching a one platform strategy

Expectations were high at HBC for DDU.Net and the version called the Studynet. Wulff (2004) writes that they expect additional user-oriented developments of the platform so that both students and teachers will experience an intuitive product. In addition, he stresses that the one platform strategy will hopefully provide users with the experience that accessing things digitally in one place is a pleasure. Wulff mentions several initiatives related to the implementation of the Studynet in everyday living. The teachers’ asymmetric digital subscriber line (ADSL) will be paid for by the school, and a new E-learning Group consisting of teachers, leaders, the Head of quality and communication, an IT support representative, a trade union representative, and a

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67 Source: e.g. recorded conversation with John, conducted by Hansbøl, January 23, 2007.

68 A 2003 survey showed that approx. 90% of the HG students had a PC and 71% had Internet access, while 98% of the HHX students had a PC and 85% had Internet access. More than half of the students had Windows XP as their operative system (Wulff, 2004).
researcher (me) will be constituted. At the time of introduction, the school’s learning strategy is the three learning spaces (Prinda, 1999), and Wulff states that the E-learning Group will work together to figure out to what extent and how they can practice e-learning with the Studynet. The head of quality and communication concludes: “No matter how many hurdles we have to overcome, we believe at HBC that the present point of departure is that we have the optimal technological opportunities for the implementation of our communication and e-learning strategies for the digital and virtual school” (Wulff, 2004).

Microsoft Denmark (2004) was also filled with great expectations. They call HBC a technological pioneer in relation to vocational colleges and other schools in Denmark. NNIT is described as HBC’s new collaboration partner and one that will “make sure that the SharePoint Portal Server is working in the schools’ IT environment and has the central functionalities needed by the school” (ibid.). In addition, the fact that part of the contract consists of the agreement that NNIT will develop the system in collaboration with HBC and other vocational colleges that buy the system is likewise talked about. Microsoft Denmark also stresses that users only need to log on once to access everything no matter where they are located. Users can now:

- Access their own documents from any PC with Internet access.
- Communicate easily and painlessly.

Furthermore, “… every class has a homepage where they can engage in dialogs, keep track of their homework, schedule and access documents and other relevant information” (ibid.). The solution from NNIT is based on full automation. Working on assignments is a process which is easy with the portal “… because the student can pick up an assignment from any PC and the teacher can read and provide feedback on the assignment along the way” (ibid.).

The online paper Business.dk also wrote an article carrying the heading “IT giants target schools” (Breinstrup & Skouboe, 2004) in which DDU.Net is depicted as “a solution which inexpensively will bring schools to the forefront with knowledge sharing”. Both NNIT (Hansen, 2004) and Business.dk (Breinstrup & Skouboe, 2004) emphasize that the schools will work with technology just as they do in industry. These articles express the expectation that the solution will be sold at all educational levels. Hansen writes that the aim is to engage twenty-five percent of all primary schools. In compliance with this, Wulff writes that within the subsequent school year, they expect to welcome primary school students who are already familiar with the solution. One of the subheadings in the Business.dk article reads “Schools in the forefront”, and NNIT’s development director is cited as saying: “Actually, this is a matter of students receiving an education
to begin with that reflects the ways in which the most advanced private companies work. In these companies knowledge sharing, co-working on assignments, finding and discussing with each other online is customary” (Breinstrup & Skouboe, 2004).

Furthermore, the director comments that 25% of all schools need to engage with the solution if it is going to make sense financially. The then leader of the Education Group at Microsoft Denmark expresses high hopes for the students as potential industry leaders and decision makers who will have had such good experiences with the Microsoft products that they will use them later. Also, the Microsoft head states that experiences from Denmark will be translated to Sweden, Norway and Finland, where the school systems resemble the Danish one. Another subheading in the Business.dk article is “One point of entry to everything”: “At HBC the next school year will begin with spending half the day teaching teachers, students and the administration about the new system … As everything is run through an Internet program, it doesn’t require that much instruction” (Breinstrup & Skouboe, 2004).

HBC’s head of quality and communication states:

For the first time we have what we have dreamed of for many years – everything gathered in one place with one point of entry to everything. This way you do not have to get used to many different systems. Everything is gathered in the Studynet: All messages, résumés, news, assignments, etc. And it can also be used from home. Now we hope that we finally have a system where we do not have to spend time on making the technology work.”

(ibid.)

The promises and expectations represented in the different articles resemble the expectations presented in the Danish Strategy for Learning, Education and IT, which was launched by the Danish Ministry of Education in 2001:

![Diagram](http://www.it-strategi.uvm.dk/frame/articleframeset.php3?type=strategiplanandsection=strategiplanandid=31)


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The above model illustrates that, at the time, the Danish Ministry of Education expected ICT integration in educational programs to follow a *movement of progression* going from getting the IT infrastructure in place and educating teachers in learning how to use IT to (finally) using IT to learn. Already in 2001, the ministry claimed that the new strategy represented the move from focusing on learning how to use IT to using IT to learn.

Both the Danish Ministry of Education (in 2001) and HBC’s head of quality and communication seem to assume that it is possible to establish a *common place* from which to realize learning potential. It is a matter of having the right platform from which things can be managed.\(^{70}\)

**Yellow pages strategy: If it exists you will find it here**

In 2004, the head of quality and communication uses the yellow pages as a metaphor to define the overall strategy of the ICT implementation of HBC’s new *knowledge sharing system*.\(^{71}\) In Denmark, just like in many countries in the world, people used to use the yellow pages in the phonebook as the place to look up telephone numbers. Today, the yellow pages have gone on-line, and they are still marketed under the catchy, but no longer (if ever) realistic, motto *if it exists you will find it here*.\(^{72}\) With the introduction of the Studynet, HBC envisioned the Studynet as the place, a portal, through which the various human actors at HBC via single sign-on would gain access to everything they needed digitally in relation to school. The head of quality and communication describes the educational ICT strategy as a *one platform strategy*. This refers to the vision that the Studynet can become a gateway for accessing all relevant information, communication, knowledge management and sharing and learning, as well as for handling administration and workflows (Eggert Jørgensen, 2007, pp. 88-89). This way of depicting the Studynet is in line with Microsoft’s branding and marketing of the SharePoint Portal Server technology that forms a basis for the Studynet and its other ICT related constituents.

**The Microsoft Learning Gateway**

In 2004, Microsoft Denmark marketed its new educational actor under the name (Microsoft) Learning Gateway. The Learning Gateway was entering a market that already consisted of several other education actors such as ICT platforms like

\(^{70}\) Several of the labels for these knowledge sharing systems present ICTs as platforms, contexts, systems and environments for managing, e.g. knowledge, learning and content. It is used here in the sense that the imaginary is that a place exists to move from.

\(^{71}\) Source: Eggert Jørgensen and a 2004 presentation of the new solution for other business colleges, 2007

\(^{72}\) See: [http://www.degulesider.dk/vbw/super/index.jsp](http://www.degulesider.dk/vbw/super/index.jsp)
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BlackBoard,\textsuperscript{73} First Class\textsuperscript{74} and Fronter.\textsuperscript{75} The Learning Gateway is a vision and framework and not one technology or solution. Learning Gateways are built as composites of standard Microsoft technologies as well as educational administrative technologies that interact and operate together. As a result, every Learning Gateway platform is a particular assemblaged and customized solution, as well as a result of how various technologies can be constructed to work together in relation to particular educational contexts. Microsoft’s educational partners specialize in Learning Gateway solutions targeting variations of educational programs. NNIT was the first company in Denmark to engage as an education solutions partner in making Microsoft Learning Gateways for vocational colleges, while HBC was the first school to implement NNIT’s DDU.Net solution. Vocational colleges in Denmark use the administrative ICT system called EASY. NNIT designed and developed this variation of a Learning Gateway solution especially suitable for EASY integration. Furthermore, each educational setting may have certain requirements, wishes and needs. Microsoft develops standard ICTs and education partners develop solutions and engage with education customers – in this case HBC. The processes involved in delivering solutions for each customer’s purposes involve customized solutions. The Studynet was a variation of a Microsoft Learning Gateway, a composite of standard technologies as well as particular ways of assembling them by NNIT in relation to the educational contexts of vocational colleges and HBC. When the Studynet, DDU.Net and Microsoft’s Learning Gateway framework were presented, they were commonly described and depicted as an assemblage of technologies by NNIT, HBC’s head of quality and communication and Microsoft:

\begin{center}
\includegraphics[width=\textwidth]{diagram.png}
\end{center}

\textit{Source: Presentations of DDU.Net/the Studynet}

\textsuperscript{73} See: http://www.blackboard.com/
\textsuperscript{74} See: http://www.firstclass.com/
\textsuperscript{75} See: http://com.fronter.info/
When Microsoft markets the Learning Gateway it uses phrases like "anywhere, anytime access" and:

The Microsoft Learning Gateway is a secure education portal that provides information and collaboration services for teachers, students and parents. It reduces administration overheads and gives teachers more time to teach.

The Learning Gateway provides a framework for blending e-learning solutions into one fully managed environment, placing the student at the centre of the education experience. A single, secure log-in to the Learning Gateway home page supplies a convenient snapshot of all work assigned. The portal's centralised environment then provides access to all current assignments and resources from any location. 76

The NNIT solution was not a complete Learning Gateway, which ideally at the time involved particular standard server technologies like Class Server, and thus did not exactly fulfill the above promises. However, this is in line with the Learning Gateway that it is presented as a framework for the enactment of many different solutions. Still, the Learning Gateway from Microsoft came with certain promising visions in the form of statements about its features:

The Learning Gateway from Microsoft is a Web-based collaboration, communications, and content delivery framework tailored for the education system. It enables teachers to manage their administrative workload, empowers students to learn at their own pace, and helps parents become more involved in their children's education …

The Learning Gateway is a framework, which means it uses Microsoft Office SharePoint Portal Server to bring together a wide range of Microsoft and third-party products into one integrated solution. Working with your technology partner, you can select the software components you want to add to the framework to create a highly customized solution for your district. 77

While the Learning Gateway is marketed as a vision and a framework rather than a platform, Microsoft’s descriptions entail promises of its inherent qualities, potential and impact on educational practices. This way of describing information and communication technologies is quite common. Usually, ICTs are marketed as being something, having certain qualities, providing functionalities, and enabling people and organizations to engage in particular activities. Thus, the descriptions may lead to the


impression that when educational programs invest in the products, the educational programs will get what is promised. This technology enables you to do this and that.

**Emerging and partially existing technologies**

The Studynet partially contains many different ICTs, each of which is no longer the same inside the composite technology. Each of the ICTs that take part in the ontological choreography (Cussins, 1996) of the Studynet can be understood as momentary final stages of processes of mobilization – usually defined as development and design practices – that predate the ICTs’ associations with the Studynet and HBC. After ‘leaving’ Microsoft’s computer science researchers, designers and developers, the technologies become marketed, distributed and translated into different contexts of engagements. In this case, they become associated with the business partner NNIT, which is a company that decides to associate them with vocational colleges and a solution called DDU.Net. Each ICT then becomes a different variation of that ICT through the partial entanglements with the other ICTs. NNIT engages ICTs in complex assemblages that require *construction work* performed by NNIT. They call their new composite technology DDU.Net, an education solution, and brand it as a new educational technology especially developed for vocational colleges. The DDU.Net becomes translated further into what, in 2004, eventually ends up as the *Studynet* at HBC. During these processes of assemblaging, things are added as well as subtracted (Latour, 1999a) from the Microsoft variations of the technologies. In addition, when moved to HBC, this variation of the DDU.Net involves a particular virtual structure designed by NNIT. This structure provides one but not necessarily the entry point for engaging with the Studynet. While appearing as a singular ICT platform, the Studynet is a complicated assemblage of several ICTs. Furthermore, when variations of both human

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78 E.g. Outlook can be accessed both without entering the Studynet and through the Studynet. ‘Inside’ the Studynet, Outlook is accessed through webaccess, which has limited functionalities compared to Outlook accessed ‘outside’ the Studynet.

79 Charis Cussins uses the concept of ontological choreographies. Latour (e.g. 2005 & 1999) uses concepts like assemblages, actor-networks, chains of translations/associations, gatherings, constructions, etc. I could also use the concept of composition. All of these concepts could be enacted in this context (which could be another useful concept) in as far as they should be understood as partially ‘getting meaning’ through their entanglements with the text. Thus, while most of these concepts could bring associations to something stable, already gathered, collected, collated, structured, planned, organized, etc., may aim is to engage the reader in imagining any ‘thing’ as *circulating references* (Latour, 1999) – things that partially move other things and become moved by other things through their circulations inside references (sociomaterial relationships). Thus, a text – or part of a text – may also be understood as coming into existence through partial connections and processes of mobilizations, which involves particular translations and sociomaterial engagements. In this sense, meaning becomes a sociomaterial accomplishment that works inside particular sociomaterial relationships. Making senses is a matter of working sociomaterial connections. Matters of fact are always worked out inside relationships with matters of concern and therefore, Latour suggests, we should instead talk about *factishes* (Latour, 1999).
(e.g. students, teachers, leaders, etc.) and non-human (e.g. news announcements, messages, texts, folders, etc.) actors become engaged with the Studynet at multiple times and locations, the Studynet emerges into a perpetually mobile – but not freely moving – sociomaterial phenomenon that is impossible to grasp and describe in an all-inclusive and once-and-for-all manner.

Understanding the Studynet and the ways in which it becomes entangled with HBC is a highly complicated matter. There seems to be no natural starting points for this engagement. Every time one attempts to describe the Studynet as a stable object, it seems to have partially moved. New technologies are added (i.e. Live Communication Server, Class Server), some technologies are substituted with other variations (i.e. new versions of server technologies), and many coexisting new practices seem to continuously engage the Studynet in the everyday living relating to HBC. Thus, technological descriptions like the ones provided by Microsoft and NNIT appear inadequate because, to begin with, they assume which technologies are involved, the functionalities they provide, and hence which practices are made available and will unfold with these platforms.

As illustrated with the math example in the previous chapter, the technologies constituting the Studynet and its qualities are not inherent to the Studynet. Instead, as Olesen and Markussen (2006) suggest, they are transcendent. Instead of thinking in terms of the properties of the Studynet as an already existing platform to move from, the math example suggests that we should instead think in terms of shifting specificities and moving platformations to partially engage with. In other words, as Elgaard Jensen (2004) suggests – referring to John Law’s book Organizing Modernity – we may engage in a shift from a focus on nouns to a focus on verbs. This shift involves that rather than looking at practices with platforms (platform as a noun, i.e. an individualized object), we should move the focus to acts of making platforms – i.e. platformations (platform as a verb and momentary effect). In other words, we turn our attention to platformations as practices (Henriksen, 2003).

From full and general to partial engagements

Several problems occur if we start by describing the Studynet and its qualities based on the fact that it is a technical assemblage, and if we start by studying how this unfolds in practice. The first problem is that this approach assumes that the Studynet and its qualities are generally available at any time in any place and for everyone. When this turns out not to be the case, we rather quickly find ourselves caught up in a comparative analysis of the promises of technology, on the one hand, and their realizations on the
other (e.g. Rattleff, 2003, discusses the reoccurring paradox of a mismatch between literature’s imaginaries of ICTs’ principal advantages – in her case in relation to computer conference communication – and the students’ actual communication practices). The weakness of this kind of analysis is that the studies take their point of departure in a priori assumptions about ICTs and their supposedly general and generalizable qualities. Thus, the analyses risk making sense of things in relation to these assumptions rather than focusing on the ways in which actual entanglements are made and come about in the everyday living related to HBC and its actors.

As mentioned previously Latour suggests that essence is existence and existence is action. If we start from the assumption that the Studynet is a technology with inherent qualities to begin with – that it is an autonomous object to be used in practice – then it may make sense to start by defining what this object is, and by following the movements of this object into practice. My inspiration stems from ANT, which is why my analyses pay attention to the different chains of associations inside which the Studynet moves and becomes translated as an actor. As a result, this research is a study of the partial connections (Strathern, 2004) inside which the Studynet exists, and thus, a study of the Studynet as a partially existing object (Bruun Jensen, 2004b). When the Studynet enters HBC it is already entangled with multiple ICTs, companies and other actors, and in order to become a part of HBC, it must engage with the different actors taking part in the everyday living related to HBC. In other words, the Studynet coexists and coemerges with the ontologically multiple and perpetually moving choreographies (Cussins, 1996) of the everyday living related to HBC.

As Sørensen (2006) points out, ICTs are not designed and developed in one place and used/applied in other places. A simple application of things is not possible. The design and development of ICTs is as much an aspect of everyday living related to educational programs as it is a matter of concern for IT companies. But actors (e.g. schools and IT companies) engage and practice development and design processes differently. An indication of this is that HBC’s actors are concerned with introduction and use practices. When mentioning development of the Studynet at HBC, this is usually a matter of either adding new ICTs, functionalities, new versions of existing ICTs, new interoperabilities, or a matter of assisting Microsoft or NNIT in providing useful feedback that can be used to further develop the usabilities of the Studynet, e.g. by improving SharePoint, user interfaces, the development of special web parts, etc.

As mentioned in the beginning of this chapter, NNIT, Microsoft and HBC introduce the Studynet as an already existing point of departure of things. Jason and John also anticipate that the introduction of the Studynet means the introduction of a digital platform to operate from. Instead of developing a platform, they have invested in a
platform this time that has been developed and already works. As a result, all that is needed is that they (students, teachers and the administration) become familiar with and start working with it. It is easy from this imaginary to conclude – as they do – that students, teachers and the administration only need brief introductions to the functionalities made available by the Studynet. Also, since the advantage of the Studynet is imagined to be the one platform strategy, it seems logical and non-problematic to emphasize – as they do – that everyone should now dedicate their engagements fully to the Studynet and thus leave other ICTs behind. In relation to this imaginary, the IT support, head of quality and communication and e-learning coordinator decide to restrict student access to Hotmail from school to motivate them to use the Studynet as their point of departure for activities. Furthermore, teachers are encouraged to stop using their homepages and start using the Studynet instead. The homepage domains are being closed down, and so are the local drives where students, teachers and the administration would previously archive their digital documents and other resources.

In other words, the introduction of the Studynet to the everyday living related to HBC takes its point of departure in imaginaries of the Studynet as an autonomous object providing the qualities needed; this imaginary becomes part of the initial engagements with the Studynet that are enacted at HBC. I define these engagements as full engagements. The math example in the previous chapter demonstrate how this vision and imaginary about full engagements with the Studynet as the platform – one entry to fulfill all digital needs – do not hold generally in practice. The math example also clearly shows that the Studynet’s promised qualities as presented by e.g. NNIT and Microsoft do not generally apply to HBC.

With regard to math, we saw that it is not possible to access everything digitally in one place. This is not a problem to be solved but rather a condition which is important to engage with. Any one teaching instrument does not have the central functionalities needed by the school. By logging on (if at all possible), users do not gain access to everything they need no matter where they are located. The users do not necessarily have access to PCs with Internet access. Even though each class has a homepage, it does not mean that the students can communicate easily and painlessly, keep track of their homework, etc.

In relation to the math example, enactments of the Studynet as the platform for things is unrealistic and problematic. When engaging in this imaginary, it has the partial effect that student, teacher and administration’s use of ICTs becomes generalized, (uni-)directed and foundationalized. This approach is problematic because it ignores the moving specificities involved in the everyday living at HBC. It also ignores the moving
specificities involved in making the Studynet compatible with the variations involved in the everyday living relating to HBC.

When moving the focus to platformations ‘of’ the Studynet as perpetually mobile and emerging practices – as illustrated with the math example and the examples of the introduction and representations of the Studynet presented in this chapter – the specificities and important variations of points of departure for engagements in the Studynet come to the fore. They show that inside the moving specificities of the entanglements of the Studynet with everyday living, the positionings of the Studynet also move in multiple directions. In other words, no singular place exists to get technologies in, and technologies are not places to move from. Inside the moving specificities of ICT integration, variations of directions (e.g. working with homepages) and partial (dis-)engagements and (dis-)connections (e.g. closing access to homepages and Hotmail) coexist with them. I suggest that this is another methodological key to understanding the ways in which ICTs become part of and take part in moving the everyday living related to education.

Current summation

As illustrated in the previous chapters the specificities of everyday living take part in constituting the ways in which the Studynet becomes part of and takes part in moving everyday living. The Studynet was partially introduced as the new platform of things at HBC. However, in relation to math in the Frederikssund school, we saw that the Studynet became part of the already existing ontological choreographies (Cussins, 1996) of everyday living relating to the specificities of math teaching, the Frederikssund school and the student and teacher access to computers and the Internet from home. In-between these specificities involving, for example, Mathcad and students’ limited access to the Studynet from home, the Studynet became partially disconnected from the math activities.

So far, by moving the contexts of knowledge and engagements, we have seen two very different variations of enactments of the Studynet in relation to the everyday living at HBC: One of them centralized the Studynet as the point of departure for things, and the other one decentralized the Studynet as a partially (non-)existing actor in everyday living. Each one represents a variation of what it may mean to engage (with) the Studynet in everyday living.

One way to lay out these two examples is to suggest that the math example is an example of the realization of the Studynet in practice, while the other one is an example of imaginaries and visions involving the Studynet and how it will work in practice that
Chapter 2: Movements

does not cohere with what is actually going on in practice. This description would not be entirely wrong. But it would not be entirely correct either. Each variation represents possible ways to engage (with) the Studynet in the everyday living related to HBC. These variations, however, are not equally relevant for everyone, everywhere at anytime. Furthermore, each variation may occur as a partially existing momentary result of processes of associations as well as a partially existing point of departure for engaging in processes of associations engaging the Studynet as an actor in the everyday living at HBC.

The two examples illustrate two central points. The first point is that even though a point of departure may be initiated in the full engagement approach, any engagement with the Studynet will still partially exist. The second point is that even though a point of departure may be taken in the partial engagement approach, engagements with the Studynet may still make the Studynet the center of attention. The foundations for engagements with the Studynet move with the specificities of the engagements. This means that the Studynet’s agencies also shift.

This thesis raises the question: How does a knowledge sharing system become part of and take part in moving the everyday ways of living associated with the secondary school programs at a Danish business college?

So far several answers have been suggested. Each answer must be viewed as a way to partially open up the issue.

In Chapter 1, the answer to this question is that a knowledge sharing system may become part of and take part in moving the everyday living in multiple ways. Inside the specificities of ICT integration, variations of relevance exist and variations of partial (dis-)engagements are made, i.e. in math the Studynet (at that time) does not really become a part of and take part in moving the everyday living, partially because the circumstances do not make it relevant and partially because the current specificities of math teaching partially (dis-)connect the Studynet.

The chapter concludes by suggesting that variations of relevance, (dis-)engagements and partial (dis-)connections exist inside the moving specificities of ICT-integration and that this may be a methodological key to understanding the ways in which ICTs becomes part of and take part in moving everyday living related to education.

In Chapter 2, the answer to the above question is that just like variations of relevance and specificities of ICT integration exist, variations of directions of movements involving the Studynet exist – and partial (dis-)engagements relating to them. The
Studynet may become *the* platform to work from and it may become a part of the ongoing movements of platformations at work.

In conclusion, one suggestion, as mentioned earlier, is to move the focus from the Studynet as an autonomous object – a platform with qualities entering practices – to the Studynet as emerging practices or platformations. It is argued that a variety of points of departure for engagement in the Studynet move the positionings of the Studynet in multiple directions. Thus, inside the moving specificities of ICT integration, the variety of directions and partial (dis-)engagements and (dis-)connections coexist with them. This may be another methodological key for understanding the ways in which the Studynet becomes part of and takes part in moving the everyday activities associated with HBC.
I call this chapter a vignette.\textsuperscript{80} I do this to illustrate that the reader is invited to engage for a moment with some of the resources that have partially inspired the two previous chapters. My methodological cues come from a variety of resources within Science and Technology Studies (STS).\textsuperscript{81} More specifically – as already mentioned in Chapter 1 – I associate my interests with the branch called actor-network-theory (ANT) (Bruun Jensen, Lauritsen & Olesen, 2007). STS can be divided into three approaches: a functionalistic, a socio-deterministic and an integrative tradition. ANT ‘belongs’ to the integrative tradition (Fuglsang, L., 2005).

From 1980 and onward, empirical philosopher Bruno Latour\textsuperscript{82} and his sociology colleagues, Michel Callon and John Law, jointly formulated and developed what was to become the ‘non-foundational’ positions and concepts of ANT (Elgaard Jensen, 2005). It is against the basic tenets of ANT to think of any actor – including actor-network-theory – in terms of being an entity with a stable core. ANT is to be understood as continuously on the move (as is everything else) and undergoing processes of translations through enrollments in various activities. ANT is always in the process of be-coming.

The book Actor Network Theory and after by Law and Hassard (1999) marked both an ending and a new beginning of actor-network-theory. In the book, some of the central contributors to ANT discussed how actor-network-theory had developed and undergone many translations since its origins in the 1980s, and maybe especially because of the

\textsuperscript{80}“In theater script and poetry writing, \textbf{vignettes} are short, impressionistic scenes that focus on one moment or give a trenchant impression about a character, an idea, or a setting. This type of scene is more common in recent postmodern theater, where adherence to the conventions of theatrical structure and story development are jettisoned. It is particularly influenced by contemporary notions of a scene as shown in film, video and television scripting. Unlike the traditional scene in a play, the vignette is not strictly linked in with a sequential plot development but establishes meaning through loose symbolic or linguistic connection to other vignettes or scenes. Vignettes are the literary equivalent of a snapshot, often incomplete or fragmentary. In poetry, in the quintain form, they can relate to a short descriptive literary sketch or a short scene or incident from a movie or play. The use of vignettes is suited to those plays in which theme, image, emotion and character are more important than narrative, though this doesn't mean that a vignette is out of place as an element in a more narrative play.” (Source: Wikipedia – The Free Encyclopedia. Accessed on June 14, 2009: \url{http://en.wikipedia.org/wiki/Vignette_(literature)}).

\textsuperscript{81}Sometimes referred to as Science, Technology and Society Studies.

\textsuperscript{82}Latour (Crease et al., 2003) defines himself as an empirical philosopher, and he also calls himself a sociologist (2005). For more knowledge about Bruno Latour and his manifold writings, I can recommend visiting Latour’s homepage: \url{http://www.bruno-latour.fr/biography.html}, accessed on March 14, 2008.
intellectual quarrels that took place between postmodernists and realists in the 1990s that are referred to as the science wars\textsuperscript{83} (see Latour, 2005). These debates had particular influence on STS, and partially mark the difference between what is now referred to as actor-network theory and after actor-network-theory.

The difference between these variations of ANT is presented by Law and Hassard (1999), who explain that the initial ANT research concentrated on and emphasized relational materiality, i.e. that entities gain form through relations, and that ‘after’ ANT research emphasized performance and added that entities are likewise performed through relations. This description is of course a much too short, progressive and simplistic way of describing ANT, and it creates the problem of where and how to (dis-) engage with and (dis-) place ANT literature in relation to the two sides of the divide. As Latour (2005) also writes, we may find literature that does not carry the label ANT, which would easily qualify as ANT related, and we may find literature that claims to be ANT related, which is surely not.

The material I present is in no way an exhaustive attempt to say what there is to say about ANT.\textsuperscript{84} I do not present a particular position within ANT either. I present variations of STS resources, which I relate to and enact partially in relation to my interests in this research. Not all of the researchers that I refer to necessarily present themselves as particularly associated with actor-network-theory (e.g. Strathern, 2004). Calling this gathering a presentation of STS resources is inspired by Bruun Jensen (2004), and makes it possible to 1) not present the foundations of this research without making this research be research without grounds, 2) allow the resources partially represented to be viewed as resources for engagements in STS, and 3) show that what is presented here is a particular way of moving things.

\textsuperscript{83} I do not explore in detail the large amount of critique aimed at ANT in the past. In Reassembling the Social, Latour discusses some of the past critique, which according to Latour, is connected with different interpretations of what ANT should be about compared to what e.g. Latour intended. John H. Zammito (2004) also discusses especially Latour’s contributions to ANT and the consequences his understanding of science may entail.

\textsuperscript{84} If the reader should be further interested in getting to know more about actor-network-theory, Lancaster University (where Professor John Law, senior lecturer Vicky Singleton, and Professor Lucy Suchman, among others, work at the Department of Sociology) has an on-line resource. See, for example, John Law: \url{http://www.lancs.ac.uk/fass/sociology/research/resalph.html#law}. Or visit the Actor Network Resource maintained by John Law (Science Studies Centre, Department of Sociology, Lancaster University). Here you can find valuable guidance when reading ANT literature i.e. central ANT discussions, how to get started with your reading, which themes ANT work focuses on, who to read when interested in particular subjects, etc. See: \url{http://www.lancs.ac.uk/fass/centres/css/ant/ant.htm}. In Denmark we have DASTS (Danish Association for Science and Technology Studies see: \url{http://www.dasts.dk/}), where, on line, there are, for example, recent Danish PhD dissertations contributing to STS. The Danish Centre for Science-Technology-Society Studies’ homepage has an on-line series of working papers as well as Danish researcher Casper Bruun Jensen’s STS resource (from 2004) with references to important literature related to STS: \url{http://sts.imv.au.dk/Onlinetekster.html}. 

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Relativist realist constructivism

There has been some confusion about how and where to ‘place’ ANT. In *Reassembling the Social* (2005), Latour strongly insists that ANT is simultaneously a relativist, a realist and constructivist approach. ANT, as mentioned, takes its point of departure in a relational understanding, and has also been called a materiel semiotic (Elgaard Jensen, 2005). The point of access is the understanding of all entities as taking form through their relationships with other entities. The concept of network is, according to Elgaard Jensen (2005), to be understood in its broadest sense; there are no a priori definitions about a network’s size, no restrictions on certain types of network relations, and no requirements for the stability of a network. ANT work mostly deals with heterogeneous networks and meaning networks consisting of many different types of relations (Elgaard Jensen, 2005, p. 189).

In actor-network-theory, the *actor* is not necessarily a *person*, it might as well be a *thing*, a *group* or an *institution*. Actors are always *performative* definitions (Latour, 2005) and actors are always *composites* of both human-non-human and material-immaterial gatherings. The terms *actant* and *entity* are sometimes used in ANT to avoid misunderstandings stemming from other theories’ use of the concept of *actor*, which mostly relates to human beings (Elgaard Jensen, 2005). I will use the terms *actor* and *entity* interchangeably. In ANT, actors are to be understood as assemblages of relations, and hence always to be understood as actor-networks. To Latour (2005a) actor-networks are actors that are made to be actors – things that act – through particular *chains of associations* (Latour, 1999a). This is what makes *things* become matters of performance – constructions – events – enactments – manipulations. Performance, however, is always a collective effort, and not just related to researchers’ or any other single actor’s engagements.

Any phenomenon is understood as existing through processes of mobilizations. This means that issues of power, authority, rules, orderings, structure, agencies and any other subject science may pursue are viewed as things to be studied rather than providing explanations of ‘other’ things. This is, as mentioned in Chapter 1, what Latour refers to

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85 I prefer to call it a relational rather than a relativist approach. Relativist signals too much choice and openness, whereas relational signals that it is always inside relationships that things are constructed.

86 Elgaard Jensen refers to networks while Latour, in *Reassembling the Social* (2005), emphasizes the hyphen between both actor-network and actor-network-theory. I take this to be an example of Latour’s way of playing with ways to articulate the relationships of things. In the so-called after actor-network-theory approaches (Law, 1999), which also Elgaard Jensen refers to, there has been a discussion about the different topologies of networks. I believe that when Latour emphasizes the hyphen in *Reassembling the Social*, it is to show that he does not understand networks as some thing and actors as another. Just like he has proposed human-non-human as a way of entirely bypassing the subject-object discussion, actor-networks (which is any actor) is Latour’s way of entirely bypassing the actor versus structure discussions, which have occupied sociology.
Vignette 1: A science ’of’ movements

as making things mediators. Letting things become mediators means that there is nothing certain about the point of departure, the end result or forms and matters. What is contained, how it becomes contained, and how it contains are being questioned.

Viewing science as enactments and actors means acknowledging that science always mediates – moves – what it enacts. This means that science is always a matter of partial translations. Latour (2005) tells us that if we need a framework to analyze what is going on in practice, then ANT is the wrong choice. It is not possible to apply ANT to anything. ANT-oriented research requires engagements, workings and effort. This obligation should be understood in relation to the concept of translation, which is another key concept in ANT. When viewing actors as constituted by networks of relations, it becomes important to ask how coordinating arrangements are enacted and enact. How are (dis-)connections made? Any connection implies translations:

To designate this thing which is neither one actor among many nor a force behind all actors transported through some of them but a connection that transports, so to speak, transformations, we use the word translation – the tricky word ‘network’ … defined … as what is traced by those translations in the scholars’ accounts … there is no society, no social realm, and no social ties, but there exist translations between mediators that may generate traceable associations.

(Latour, 2005, p. 108)

According to Elgaard Jensen (2005), the term translation stems from the French philosopher Michel Serres, who defines translations as forms of mediation. Law (1999), referring to the romance languages, also suggests that translation means betrayal. This is another meaning of translation that ANT relates to. From this acknowledgement follows the prerequisite that research can never be a matter of application. Researchers always transform what they engage with.

Constructivism!?

As introduced by Latour (2005), actor-network-theory is an attempt to understand the living world as made by assemblages of assemblies of relations in complex and heterogeneous ways. To ‘capture’ this, the concept of actor-networks has been introduced to include actors (as always being hybrid human-non-human and material-immaterial constitutions) as always already connected with structures in what is called actor-networks. It is important not to confuse ANT with social constructivist theories. Latour argues that ANT is a move away from taking the point of departure in an a priori understanding of the social as: “… a specific type of ingredient that is supposed to differ from other materials” (Latour, 2005, p. 1).
This is what Latour claims has been the project of social constructivists as well as critical sociologists. In opposition to this, Latour views the social as “… a movement during a process of assembling …” (Latour, 2005, p. 1).

In other words, either sociology has its point of departure in social explanations, taking for granted that the social is always already there in particular forms, or sociology returns (according to Latour) to the original pursuit of tracing connections. The former approach takes for granted what the latter remains curious about: “In the alternative view, ‘social’ is not some glue that could fix everything including what the other glues cannot fix; it is what is glued together by many other types of connectors” (Latour, 2005, p. 5).

Andersen (2000) discusses the concept of (social) constructivism in science studies with a focus on sociology. He claims that, in sociology, the terms social constructivism and construction have both gained emphasis since 1965. It is, however, according to the author, not until the 1980s that constructivism/constructionism implies a particular direction within science. Andersen traces the concept of social constructions back to Peter L. Berger and Thomas Luckmann’s 1966 book, The Social Construction of Reality. He points to the development that the increase in popularity also seems to have left its references less clear, more implicit and taken for granted. In especially the 1990s social constructivism in sociology began to be discussed not as a theory but rather a concept, which covers a broad range of rather divergent approaches. Andersen problematizes that there seems to be no established agreements on what construction actually refers to. It seems as if especially new phenomena acknowledged as belonging to the modern and postmodern society are being categorized as constructed.

In the following, I will engage briefly in some of the discussions on the term (social) constructivism/constructionism that have engaged science studies with a focus on sociology and social psychological studies. The discussions bring to the fore some of the many important differences these common terms refer to, as well as what it is that Latour has emphasized as particular to ‘his’ variation of constructivism.

In 1979, Latour and Woolgar wrote Laboratory Life: The Social Construction of Scientific Facts, and already in 1986, when publishing the second edition of the book, Latour and Woolgar removed the word social from the title (Andersen, 2000, p. 6). One could say that this small maneuver was an early indication of some of the problems involved in the processes of mobilizing what was at the time a somewhat new concept of science as matters of construction rather than pure descriptions of the world ‘out there’. The term construction in science has since then become an actor in the midst of
several debates between e.g. realists and relativists, materialists and idealists, believers and non-believers, etc.

Basically, Latour (2003) argues that the main reason why he and Woolgar removed the social from Laboratory Life was that they realized that the ongoing discussions involving the term social constructivism enrolled their concept in relationships with which they did not identify. According to Latour, the social was being discussed as the stuff things were made of, and construction in those discussions became increasingly associated with being not real. Being not real refers to the imaginary that science constructions may be viewed as particular (invented) narratives about the world, which could (easily) have been different. Thus, relativism became an opposition to realism. In Latour’s eyes, this is, for example, exemplified by the deconstructionists – who he also calls iconoclasts (2002) – who set out to uncover the real behind the social constructions in the world. Latour and Woolgar intended – according to Latour (2005) – social constructivism to refer to the acknowledgement that the world is neither constructed nor real, but really constructed. They intended the social to signal the processes through which the world becomes the world. Rather than being interested in asking epistemological questions like How do we know?, the authors wanted to address the need to ask questions like How does reality become reality? The social – alias society – according to Latour, became the stuff to understand things with, rather than the stuff that needed to be understood. What is of interest to Latour is that society is a particular construction – a circulation – and that we should study the fabrications of this. We cannot explain the fabrication of the social with the social, he argues (2005).

Brown (2002) argues that social psychology has been occupied by a three decade old crisis revolving around the relativist-realist debates. He claims that the social constructionist arguments are based on a philosophy of ‘suspicion’ or ‘unmasking’. Brown views this – in line with Latour which Brown refers to – as highly problematic as it leaves little space for curiosity. Another problem that Brown raises is that social constructionist critiques of mainstream psychology become too unified as they take an externalist approach, which does not make us more knowledgeable about the multiple ways in which the so-called mainstream psychological traditions seem to (still) hold together in many creative ways. Instead, Brown suggests that we use internalist criteria for understanding how things work. Rather than marking social constructionism as a position negatively aligned with the mainstream, Brown suggests that instead we attend more to the different workings ‘of’ psychology at play: “… social constructionist psychology draws its critical verve from an alignment with the social sciences against the natural science impulse in mainstream psychology” (Brown, 2002, p. 72).

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87 Latour refers to critical sociologists.
Vignette 1: A science ’of’ movements

Rather than substituting one belief (i.e. mainstream psychology) with another (i.e. social constructionism) – neither of which actually exist as one – Brown proposes a non-foundational psychology. One which does not a priori favor/set aside particular foundations. This believing in nothing in particular is usually referred to as relativism (Brown, 2002, p. 73). However, rather than believing in nothing in particular, Brown suggests that it should be understood as a move from believing in the general to believing in the particular.

Brown argues that the greatest problem of social constructionism stems from becoming over-enamoured with the construction metaphor (Brown, 2002, p. 78). Instead of generally losing belief in the sense that we imagine everything to be just a (language representation) construction that could have been otherwise, the aim is to engage with the particularities of variations of real constructions.

Søndergaard (1996) discusses social constructionism from a different angle. Like Andersen (2000), Søndergaard starts by stating that social constructionism is a term covering not one, but a number of different contributions. Søndergaard’s approach, like Brown’s is psychological. In her argumentation, however, Søndergaard is not concerned with the imaginary of social constructionism as a position in opposition to mainstream psychologists. Søndergaard is concerned with the different naming of and approaches to social constructionism.

Søndergaard presents social constructionism as an essence-dissolving approach, which means an approach that does not assume a priori what things are essentially about. The author refers to discourse psychologist Kenneth Gergen and his seminal article The Social Constructionist Movement in Modern Psychology (1985) as the social psychologist who this line of social constructionism can be traced back to. She problematizes that the emphasis on discourse may in fact be a problem within social constructionism because it involves a devaluing of the action aspect. Because, as she writes: “For the social constructionists the processes are basically born through the fluid communication between actors engaged in discourses” (Søndergaard, 1996, p. 12).

Thus, other mediating tools than language may be in danger of becoming backgrounded. The author, though, also writes that most constructionists would probably claim that they are included in their concept of discourse.

According to Søndergaard, social constructionism (with an ‘on’) is mostly a term used by psychologists, whereas sociologists speak of social constructivism (with a ‘v’), but also psychologists refer to social constructivism, which makes the situation a bit confusing. Overall, the author argues, the differences are not that great. They basically
agree on the opposition to realism and essentialism as well as modernist and positivist science criteria, and they understand the social reality as constructed by humans (Søndergaard, 1996, p. 15). Søndergaard explains that the concept of constructionism originated because psychologists already had a concept of constructivism, which related to Jean Piaget’s work. Constructionism was selected by Gergen as a way of creating distance to the Piaget oriented constructivists as well as the art tradition carrying the same label. Søndergaard presents the difference between Piagetian radical constructivists and Gergen constructionists as being matters of either individual construction processes or construction processes between humans.

Social constructionists reject the notion that humans have access to knowing the world as a representation – meaning mirroring/reflection – of the world. All knowledge is necessarily a product of dialogic space, and all knowledge influences the social world. According to Søndergaard, the radical constructivists and the social constructionists (mostly) share the imaginary of an epistemological relativism. Gergen, Søndergaard argues, moves towards what she terms an ontological relativism as well. And this is what Søndergaard is critical towards. She sees epistemological relativism as the most promising approach. Søndergaard suggests – inspired by Judith Butler – that we should instead think of the world as not pre-discursively available.

The (social) constructivist/-onist discussions revolve around whether humans form reality or reality forms humans, and both approaches, according to Søndergaard, are too radical. Instead, she suggests a variation of ontological relativism, which suggests that human actions do enact changes in the world, just like the world influences human actions.

Søndergaard’s suggested approach is somewhat in line with, but also – from my point of view – remarkably different from Latour’s constructivism, in that Søndergaard still emphasizes the social, which Latour wishes to remain uncertain about. Søndergaard’s presentation seems to represent a sort of dialectic between human constructions on the one hand, and the real objective world on the other, which will at some level interfere with each other. Søndergaard wishes to include the objective world, whereas Latour does not invoke this dialectic or imaginary about mutual constitutions. Latour does not engage with humans as actors basically outside an objective world. Instead of radical...
relativisms (epistemological and ontological), Latour suggests that we entirely do away with the distinction between the epistemological and ontological and instead engage with the hybrid (relational) constructions in the world. The point is to remain uncertain and continuously study the moving hybridities of things. We cannot anticipate that things generally cohere in certain ways. Both generalities and particularities are themselves to be viewed as constructions.

**Momentary effects**

ANT is as an effort to understand the connectedness of everyday lives in a world in motion. According to Latour, ANT turns everything upside down when compared to conventional sociological approaches. Compared to, for example, a system theoretical approach, which deals with how society and its values hold people together in a social order, ANT understands society as an *effect* rather than the *cause* of engagements and gatherings, and asks how (*collectives* of human-non-human) actors hold society together (Fuglsang, L. 2005). In other words, rather than viewing social relations as the result of society, both societies and social relations are understood as the results – *momentary effects* – of coordinated and distributed efforts of enacted and enacting actors.

Latour refers to Gabriel Tarde and Harold Garfinkel as his ‘appointed heroes’, who he considers as great inspirational resources:

> Tarde always complained that Durkheim had abandoned the task of explaining society by confusing cause and effect, replacing the understanding of the social link with a political project aimed at social engineering…. Harold Garfinkel, who believed that sociology could be a science accounting for how society is held together, instead of using society to explain something else.

(Latour, 2005, p. 13)

To Latour, matters of fact are always matters of concern, interests and particular constructions. Facts are – in other words – *events*. They are things gathered and enacted (Mol, 2002). Latour suggests that the modern world can be said to consist of assemblages of particular ways to (dis-)assemble e.g. nature and society. Latour characterizes the modern world by its quest for holistic accounts and beliefs in fundamentals, as well as the tendency to divide worlds using dualisms and dichotomies. Modern progress has (too often) been portrayed as (simple) matters of evolution, revolution and what Latour refers to as the *time of time* – relating to the imaginary of time as a particular theoretical construction related to metrological\(^{90}\) chains of associations. In this sense – Latour suggests – modernity can be viewed as a *time of_

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\(^{90}\) Metrology stems from Greek and in this case refers to the science of measurement and standardizations e.g. standards like the platinum kilogram.
simplicity. In juxtaposition with the modern world, Latour suggests that today’s world, with its focus on coexistences, cohabitation and simultaneity of time, has entered the time of place, where progress becomes matters of “… occasions to agree, compose, to assemble, to share” (Latour, 2005a). Either way, Latour argues that things become ways to disband (ibid.). Too much unity translates into too much disunity and vice versa. This comment of Latour’s is an illustration of the point that neither of these descriptions of the living world should be taken as natural points of departure for research. Relativism is to be understood as the opposite of absolutism and constructivism as the opposite of fundamentalism. Latour argues that research makes things less complex and more complicated. He claims that cohabitation in the modern world means contrasts and juxtapositions and that cohabitation in an amodern world, in contrast, refers to intertwinement. The quest of science should be to study the perpetually mobile (Brown & Capdevila, 1999) emerging ontological compositions of assemblages under the heading “less claim to unity, less beliefs in disunity” (Latour, 2005a). In other words, research should engage with an ongoing curiosity about forms of landscaping the living world, and Latour calls any landscaping a momentary phantom public. Latour proposes that science must therefore move from an object-politic towards a thing-politic when acknowledging that the sciences can also be viewed as doing politics, such that:

- politics is no longer limited to humans and incorporate the many issues to which they are attached; 
- objects become things, that is, when matters of fact give way to their complicated entanglements and become matters of concern; 
- assembling is no longer done under the already existing globe or dome of some earlier tradition of building virtual parliaments; 
- the inherent limits imposed by speech impairment, cognitive weaknesses, and all sorts of handicaps are no longer denied but that prostheses are accepted instead; 
- it’s no longer limited to properly speaking parliaments but extended to the many other assemblages in search of a rightful assembly; 

91 Which is a word Latour himself uses – I believe - as another way of playing with words that associate to the actual ongoing political and theological debates so strongly engaging the world. In Latour’s writings there always seems to be several intentional invitations to various ways of engaging in understanding what his writings refers to. I see this as one of Latour’s methodological points. It could of course also be a different translational matter in that Latour’s texts have generally been translated from French into English by people other than Latour. It may be more common to use the word foundationalist (e.g. Brown, 2002), especially because fundamentalism, today, in everyday living mostly associates to particular religious beliefs and commitments. But, this is exactly the association that I believe Latour intends to refer to. 
92 In On Interobjectivity (1996), Latour argues that the world should be viewed as complex, while each attempt to make conceptualizations of the world must necessarily complicate things. Through processes of knowledge making, he suggests that we make the world both less complex and more complicated. 
93 I take this phrase to be one of Latour’s ways of playing with words, to suggest that any kind of articulation/presentation of things must necessarily be both real and constructed.
Vignette 1: A science ’of’ movements

f- the assembling is done under the provisional and fragile Phantom Public, which no longer claims to be equivalent to a Body, a Leviathan or a State;
g- and, finally, Dingpolitik may become possible when politics are freed from their obsession with the time of Succession.

(Latour, 2005a)

Latour’s suggestion is quite radical. He proposes a questioning of the most basic assumptions of the societies in which we live. The nineteenth century constructions of the existence of societies (in plural) and nature (in singular), which are generally anticipated as natural in today’s world, must in Latour’s accounts be understood as circulations – phantom publics – and emerging and momentary effects that can be questioned (Latour, 2005).

Analytic isomorphism and uncertainty

Conventionally, research starts by positioning, i.e. by connecting with a research question, methods (qualitative, quantitative or a mix), a worldview and associated theories. In this way, research partially starts by enacting its concepts of perspectives, places, things, actors and times in relation to these theories; and also its concepts of the interdependencies and relationships between these different aspects of research, especially the ways in which to deal with them methodologically. This is usually considered a basic condition for research. In The Sage Handbook of Qualitative Research, Denzin and Lincoln (2005) write, for example: “Still, the question of methods begins with the design of the qualitative research project. This always begins with a socially situated researcher who moves from a research question to a paradigm or perspective, to the empirical world” (Preface, p. xii).

Today, in (most) research, we are firmly aware that there is no view from above or nowhere (Haraway, 1991). Positioning things may be viewed as a partially existing condition of all research (Strathern, 2004). Latour (2005) suggests that any research therefore involves landscaping things. This, of course, is problematic for any research that sets out to study the performances of landscapings in the living world. It raises the question of how it is in fact possible to question the forms of the forms of connections (Strathern, 2004) that take part in making (research) constructions. If we cannot avoid involving knowledge and knowledge practices in research, then how are we able to study things?
Latour and other STS researchers like Strathern (2004) try to engage with this concern by calling for a **symmetrical approach** (to begin with). A symmetrical approach – according to Latour – wishes to dissolve any *a priori* scaling and distinction-making, for example, between the micro and macro, local and global, simple and complex, relevant and irrelevant, central and peripheral, etc. ANT researchers do not work from the imaginary that there is a *background, inside and outside* that are naturally given in the order of things: “Ins and outs, like ups and downs, are results not causes. The sociologist’s job is not to fix their limits in advance” (Latour, 2005, p. 215).

This symmetrical approach is also referred to (e.g. by Strathern, 2004; Bruun Jensen, 2004b; Latour, 2005) as the ambition of **analytic isomorphism** – to begin with. There are several variations of ways to work with symmetrical research approaches. David Bloor introduced the *symmetry doctrine*, which was, according to Olesen and Kroustrup, meant to overcome the distinction in sociology between explanations for true and explanations for fake assumptions. Bloor’s intention was to engage in equal explanations of these apparently different forms of existence. In sociology there was a tendency to explain true assumptions as having a relation to reality, while fake assumptions were explained as having a relation to psychological and social factors. While Bloor emphasized social explanations of all instances, ANT engages differently in the symmetry doctrine. In the 1980s, Law and Callon both argued that the social should not be granted a privileged position either. Callon suggested so-called *generalized symmetry* as a methodological approach, which implies that all entities in the living world should be treated equally. All entities refer to the ANT acknowledgement that any entity is an actor-network, a hybrid existence involving multiple heterogeneous human-non-human and material-immaterial actors. Thus, both so-called social/cultural and natural relationships must be equally included, treated and studied as such. Wyatt (2008, p. 166) mentions four variations of the principle of symmetry:

- Symmetrical with respect to explaining truth and falsity (Bloor on science)
- Symmetrical with respect to explaining success and failure (Pinch and Bijker on technology)
- Symmetrical with respect to explaining the social world and the technical world (Callon on socio-technology)

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94 “ANT is not, I repeat not, the establishment of some absurd ‘symmetry between humans and non-humans’. To be symmetric, for us, simply means *not* to impose *a priori* some spurious *asymmetry* among human intentional action and a material world of causal relations.” (Latour, 2005, p. 76)

95 In Knowledge and Social Imagery, 1976.

96 This section about the generalized symmetry concept in ANT is written with reference to Olesen and Kroustrup (2007).
Vignette 1: A science 'of' movements

- Symmetrical with respect to using concepts from analysts and actors (Wyatt on method in STS)

Strathern (2004) adds analytic isomorphism as a way of acknowledging that the world is equally complex everywhere. Latour (2005), in line with Strathern, calls for co-ordinating things to begin with. Latour argues that co-ordinating things – or keeping things flat – is a way to engage in uncertainty as the first and central move in research that wishes to engage in relational and explorative understandings of what circulates in the world; and at the same time question the ways these circulations are made to become matters that matter (or not). Latour (ibid.) therefore calls for what he labels critical proximity. This is also a matter of including the researcher’s own movements inside the gathering of things. Both Strathern and Latour argue against the imaginary that (pure) description and (theoretical) explanation should/can be separate aspects of research. Instead, these authors suggest that any description entails an explanation ‘of’ things. Describing and explaining things are parts of the same move. I believe this is what Latour in Reassembling the Social (2005) points at when emphasizing the hyphens in actor-network-theory.

Central to Latour’s argument is the imaginary that any knowledge and knowledge practice always exist in the midst (Latour, 2005) of things. If we wish to engage in understandings of the movements of things, we must consider researching both the in-betweennesses and entanglements involved in the different mobilizations of things in the living world. Researchers, engagements, knowledge and knowledge practices from ‘this approach’ never exist outside or inside, but always in the midst. Thus, any existence must be acknowledged as partially (co-)existing (Bruun Jensen, 2004) with relationships that both partially contain and are themselves partially contained (Strathern, 2004).

A moving approach

Bruun Jensen (2007) points to the tendency for social science studies to engage with strategic essentialism, meaning criticizing what earlier attempts to study a given object have done in the process of legitimizing one’s own point of view. Actor-network-theory emphasizing analytical isomorphism should not be interpreted as an instance of strategic essentialism. ANT is not to be regarded an essence (a ground) from where to move (Latour, 2005), and it is not – as I understand it – a way of distanciating oneself from other approaches. It is a way to engage with different approaches to assembling things. Thus, it is not, as I engage with it, a non-foundational approach as, for example, Brown (2002) suggests, an modern approach as e.g. Bruun Jensen (2004) & Latour (1993) suggest, or a postmodern approach as e.g. Fuglsang, L. (2005) suggests, but a moving
approach. It is an approach that is concerned with *circulations* – that is *things in motion*. I thus add another label to the already many suggested namings of ANT, i.e. a sociology of *translations* or *associations/attachments* (Latour, 2005), and a sociology of *things* (Fuglsang, L., 2005). My preference is to call my approach a *science ‘of’ movements*.

Movements come in many forms and carry various names: Mobility, mutability, flow, fluidity, flying, change, development, innovation, translation, transportation, transmission, transfer, transition, learning, creativity, running, thinking, metamorphosis, imitation, progress, association, society and group. To mention a few of the more obvious. The less obvious ones that ANT researchers have focused upon are standing still, standards, labels, categorizations, scaling, proportioning, certainties, times, spaces, agencies, differences, sameness, singularity, multiplicity, plurality, perspectives, complexity, simplicity, etc.

Originally, ANT was meant to describe how science, technologies and knowledge become constructed, but in time it has developed into analytic moves to engagements in studying the circulations that produce the ontologically multiple and heterogeneous makeups of the living world. ANT takes its point of departure in understanding science, technologies and the living world as *workings* embedded in partially coexisting relationships.
A title that would perhaps be more appropriate and effective in a different way for this chapter is *Particular movements: Research as partially existing instruments for making things work (or not)*. Or, the following two short versions: *Science as movements* and *research that moves*. I have also decided to call this chapter a vignette even though it plays a different role in this part of the thesis than it did in the previous chapter. This vignette serves the purposes of revisiting the assemblages of Chapter 1 and Chapter 2 in order to discuss ways of describing, collating, archiving, disciplining and ordering matters. It is once more an invitation to the reader to reengage in the configurations already presented in the first two chapters.

**The anthropological truism**

The problem with research texts and arguments is that they tend to represent things in a way that convinces the reader that *this is* what happened and *this is* what can be learned *from this*. Drawing on Latour’s analogy of the two time travelers, one could say that when texts are done, they represent things – a machinery of things – that already work in certain ways. They can be viewed, in a sense, as trains for others to move with more or less comfortably. Most researchers acknowledge that the texts they produce are only a partial result of numerous working processes. Although we of course acknowledge that we take part in bringing results into the light, we still – as is the academic norm – have to persuade the reader into engaging with the text as *a* legitimate representation of these matters of fact. Who can imagine a PhD defense taking its point of departure in a thesis claiming to disengage with matters of fact? Or even worse, hiring a researcher who claims to be dealing with nonsense or something false, perhaps even lies? This, however, is not my errand here. I wish to pursue what Strathern (2005) calls the anthropological truism: “It is an anthropological truism that new ways of doing things, new skills, new knowledge, invariably dislodge practices and ideas already present. Even where one thinks one may be just adding, the chances are that one changes the relative weight given to existing values and perceptions” (Strathern, 2005).

Strathern argues that researchers’ continuous displacement of contexts is not simply a part of researchers’ activities, but exists as an active ingredient in Euro-American knowledge making practices. She suggests that it is part of researchers and others’
Vignette 2: Beware things are gathered!

attempts to shift out aims, arguments and assumptions. This produces the effect that what appears as new becomes new inside this displacement and juxtaposition of things. In relation to Chapters 1 and 2 one could say that I have deliberately played with a particular contrasting way of juxtapositioning things. I have arranged the chapters so that the partial engagements in math appear as a contrast to the full engagement approach suggested by the yellow pages and one platform strategies. But I have also (deliberately) aligned things differently in order not to produce this apparently simple difference. I have presented each chapter as movements. I have also engaged with a form of writing which (I hope) does not represent things as simply displaying matters of fact. The writing style I employ is an attempt to illustrate that it is *acts of representation* and *constitutive entanglements* (Orlikowski, 2007) that are at stake here. In other words, acts that produce relationships and realities. But neither the acts nor the relationships and realities produced are separate, free or neutral matters. They are real coexisting constructions (Latour, 2005) that partially contain and are partially contained by things (Strathern, 2004).

The problem that concerns Strathern (2005) is that researchers may produce comparable ends (e.g. knowledge), but the means and tools employed may differ considerably. The engagements and relationships may be fundamentally different. Strathern argues that Euro-Americans have a tendency to foreground knowledge as a precondition and means to action. Equipped with the right knowledge, we will be able to act differently. With the same knowledge, we will be able to act the same. Like Mol (2002), Strathern (2005) problematizes that what is at stake may best be described as different knowledges and perspectives (multiple voices) about the living world, i.e. one ontological context (in a Euro-American sense). Both Mol and Strathern challenge the conception that Strathern (2004) calls a pluralist conception. Strathern (2005) provides, for instance, this example: In a report, Australian Aboriginals are described as refusing to recognize their ancestors as scientific specimens. When scientists brought the remains of the Australian Aboriginals’ ancestors to a museum, the Australian Aboriginals described it as bringing living people to a hospital.

The inference I draw is that to them [the Australian Aboriginals] the difference between the two parties [the scientists and the Australian Aboriginals] was not one of perspective, and was not to be understood by reference to context. To take the case of some of the Australian Aboriginal representations, the point was that the Aborigines were related to their ancestors, the scientists were not. This made the Aborigines (relatives) different kinds of people from the scientists (strangers). They did not inhabit a position from which an ancestor could also be a specimen. For as

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97 The agenda of *The Sage Handbook of Qualitative Studies* (Denzin & Lincoln, 2005) is presented as: “This is the agenda of this third edition, to show how scholars can use the discourse of qualitative research to help create and imagine a free democratic society” (Preface, p. x).
Vignette 2: Beware things are gathered!

different kinds of people their relationship to the human remains gave the two parties claims of a quite different order. The one could not just put itself in the other’s shoes.

(Strathern, 2005)

Strathern suggests that instead of engaging with things as matters of knowledge, we should pay attention to the production of relationships and ways of being. The Australian Aboriginals and the scientists do not know things differently, they are differently engaged. Strathern suggests that knowledge is basically the same, but relationships and knowledge practices differ. Knowledge is not in itself a safe path to action. You could argue that I have in the first two chapters also played with the sense of this distinction between context, on the one hand, and different perspectives on the other. One way to engage in the chapters would be to state that they represent different perspectives on the same context, situation or thing. I have deliberately, however, presented the two chapters as different though (here) partially related constitutive entanglements that take part in the makeup of this thesis. In other words, I do not see each chapter as presenting different views on the same situation. Each chapter entails different situations and relationships (i.e. teaching math and the introduction of the Studynet) that are brought together as part of another situation (i.e. the endeavor to earn a PhD).

Danish psychologist Edgar Rubin’s vase – a picture illustrating both a vase and to faces looking at each other – serves as another analogy to define what I am attempting to do. Rubin’s vase may be enacted as an illustration of what Mol (2002) and Strathern (2005) refer to as a perspectivalist engagement. All of the information is in the picture of Rubin’s vase. What we do is attend differently to it. We can attend to different parts of the whole picture. But the picture exists as a body separate from the human body/mind trying to make sense of it. Thus what moves is not the picture and our engagements with the picture, but the ways we see it. In relation to Chapters 1 and 2 this perspectivalist approach would perhaps result in the conclusion that different actors at the Hillerød Business College see things differently. This, in turn, may be viewed as a problem to overcome, and the better view would be to see things like ‘this’. Another argument is that instead of seeing only one side of things (i.e. either the vase or the faces), we should engage in both and ‘others’, because this will enable us to better understand and rework the challenges in possibly contrasting agendas.

Suppose, instead, the problems begin with the process of providing information as such. If one is outside the framework of shifting perspectives and re-making contexts, the possibility of compromise as a compromise between viewpoints may not even be conceivable. It would not be sufficient to rely on the power of knowledge, to rely on displacement by context, so that one perspective becomes replaced by another. This is not just because words lack power, but because the
epistemological techniques that make another perspective persuasive are not in place.

(Strathern, 2005)

Action does not naturally follow from knowledge and knowledge from action. As Strathern (ibid.) also notes, knowledge may only be a partial precondition and means to action. What perhaps matters the most is relations and relationships.

In her book *Partial Connections*, Marilyn Strathern (2004)\(^9\) discusses the problem of proportioning, which she sees as a fundamental problem in all research. In Euro-American accounts, Strathern argues, there is a tendency to view complexity as matters of increased zooming in on things, i.e. going into detail. The more details there are, the more complexity seems to be the answer. This understanding relates to the imaginary that we can switch perspectives. The imaginary of switching perspectives has the relativizing effect that approaches are always partial. We imagine that we can move discretely between things by switching perspectives, and this entails the notion that we can talk about the plurality of things. Furthermore, we believe that we move closer to things by altering the magnitude of things from dealing with one to dealing with many instances of the objects we are trying to describe. Moving closer and increasing complexity at the same time creates less. The closer we get, the more we become aware of the partiality of things, and that we are not able to grasp the whole. We may only be able to describe parts of the whole. This is what Strathern calls a plural perception of the world (2004, p. xvi) which takes its point of departure in a part-whole logic and an imaginary about the world as being fragmented. This entails the imaginary that if we can only engage in enough perspectives, we can describe the whole situation. When selecting perspectives we describe parts of the situation and leave other parts for others to describe. Strathern suggests that anthropology in the late twentieth century has moved from a plural to a postplural perception of the world. This takes its onset in an imaginary about the world being fractal. Instead of understanding an increase in magnitude as an increase in complexity, Strathern suggests that we should move from the imaginary that the information stays the same. The world is equally complex, no matter how we imagine that we engage with it.

A fractal approach understands domaining/regionalizing the world as accomplishments of enactments of focal points or areas, i.e. things we imagine we can hold still while we study movements in and across these particular enactments of contexts. This is partially why we imagine that we can return to the same context and complete the picture by adding the remaining perspectives (missing pieces/fragments/parts of the puzzle). Pluralist approaches, according to Strathern, take scaling to be a natural given in the

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order of things in the sense that it is often assumed that we can a priori talk about more or less primitive and complex societies, technologies and times, whereas: “A fractal approach … recognizes that the construction and deployment of scales are invariably features of interaction. And through their analyses social researchers invent and deploy yet more scales,” (Bruun Jensen, 2007).

According to Latour (2005), one of the oldest and most influential propositions made by ANT is that “Scale is the actor’s own achievement” (ibid., p. 185). Both Strathern (2004) and Latour (2005) argue that Euro-American research within social sciences (Latour) and anthropology (Strathern) has a tendency to partially connect with certain imaginaries of measurement and zoom.

Actor-network-theory (ANT) is based on “… an intentionally oxymoronic term” (Law, 1999, p. 1). Actor-network is a composite of structure and actor implying that neither exists in solitude. ANT seeks to dissolve a priori distinctions like local/global, micro/macro, and content/context. The term actor-network can be viewed as an intentionally hybrid term that connects what has been disconnected in modern sciences distinguishing between micro (in here/local) and macro (out there/global) relations (Bruun Jensen, 2007). It emphasizes that when focusing on one side of the hyphen, you cannot avoid engaging in the other as well – whether making it present or absenting it in the research. They are part of the same move. Latour (2005) suggests that one way to not continue the engagement with these enactments is to entirely bypass distinctions like micro/macro, society/nature, objects/subjects. The point is to move the focus to the multiple, complex ways in which things come into existence (and disappear) through emerging hybrid constructions. Much ANT literature still refers to hybrid concepts like sociomaterial (e.g. Mol, 2002 & Orlikowski, 2007) and sociotechnical (e.g. Bruun Jensen, 2004). These concepts may lead to the assumption that any thing involves both something social and material or social and technical. Latour (2005) refers to human-non-human and argues that these concepts only make sense in relationship with each other. In other words, it does not make sense only to talk about humans or non-humans. The problem remains, however, that either conceptualization, whether sociomaterial, sociotechnical, human-non-human, material-immaterial, still takes its point of departure in particular constituents. These constituents are part of particular ways of imagining actors in the living world. Latour’s suggestion to entirely bypass these constructions seems fruitful for the engagement in uncertainty about the relationships and constitutive entanglements (Orlikowski, 2007) that make up the living world. However, if the many different ways to make relationships in the living world are included in this uncertainty – without the pursuit of a particular theory about this – then bypassing these circulations does not seem appropriate either.
Vignette 2: Beware things are gathered!

Latour proposes that things are made to become things inside particular chains of associations/translations (Latour, 1999a), and rather than framing things (Latour, 2005) we should study the different existences of ways to frame. As Latour (2005) adds, this means acknowledging that both the things we are studying and researchers and their research always appear in the midst of things. This is a condition of research that we cannot avoid. Being in the midst does not refer to an actual center, but to the partialities of research. Based on her anthropological studies in Papua New Guinea, Strathern (2004) argues that any ‘one’ form – an identity – partially contains many forms within, and at the same time they are in turn being partially contained by other forms (ibid, p. 67). One of the many central contributions of Strathern’s work is the acknowledgement that presences are always partial. Inspired by Strathern, partialities is a key concept in my approach. Partialities refers to the enactment of identities – existences – that is relationships. Things become things through their partial connections with ‘other’ things. Bruun Jensen (2004b) suggests the concept of partially existing objects. Often cited, this line: “If ‘one’ contains ‘many’ then one is also a version of many” (Strathern, 2004, p. 68) is central to understanding Strathern’s point.

As a result, in relationship to the concept of partialities I associate the concepts of coexistences and interobjectivities. Understanding things as being partial, partially connected/connecting things, and acknowledging the subsequent ontological multiplicity (Mol, 2002) of identities bring a further recognition of the ‘fact’ that no matter what research enacts, all it can ever do is be partially in the midst of things. Strathern (2005) cautions us to not a priori settle on the character of these relationships if we wish to study them. This means that neither a pluralist (fragmented) nor a postpluralist (fractal) account should be the point of departure of things. Instead, as Strathern (ibid.) shows, there exists many variations of ways to enact relationships in the living world, and this is what should spur our interest.

Much educational research100 in Denmark is qualitative research (e.g. Denzin & Lincoln, 2005), and can be called standpoint research101 in the sense that it takes point

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99 Neither chains nor associations/translations should be taken as having certain forms. A chain in English can be both an association and a necklace. Any association in Latour’s understanding is a partially existing assemblage of things – a hybrid. Latour suggests that re-searchers study the hybridities in the living world.

100 Most educational research in Denmark is qualitative according to the OECD (2004a). “Much of the Danish educational R and D can be characterized as applied research that seeks solutions to practical questions in education, with less emphasis on developing, testing and advancing theory. Hammerhøj and Schmidt (1999) concluded that there is a general lack of basic research and, in particular, theoretical educational research in Denmark” (OECD, 2004a, p.8). “Research is usually defined as knowledge creation that conforms to agreed scholarly standards in its production, ones that warrant its validity and trustworthiness. Research knowledge may be created for multiple purposes, including for its own sake, as well as for application to policy or practice. Research is sometimes differentiated into basic (or ‘blue skies’) research, which is driven by curiosity and an inherent interest in a phenomenon or problem, with
of departure in a worldview. However, as Strathern notes, shifting instruments involves shifting relationships, which means that researchers do not stand in one spot and understand things from that location. As Latour (ibid.) writes: “Scientists never stand in their standpoint” (Latour, 1999a, p. 66).

If we do not engage in the imaginary that there is one world, which we can perceive differently, and instead engage in studying acts of making the world and relationships in the world, we, as Strathern (2005) suggests, might not only move the context of knowledge that takes part in research but also the grounds in relation to which researchers understand their objects of analyses.

Ups and downs, ins and outs (e.g. Latour, 2005), right and left, high and low, big and small, change and standing still, proximity and distance, good and bad, old and new, presences and absences, connection and disconnection (e.g. Strathern, 2004), general and particular, subject and objects (e.g. Moser & Law, 1999 & 2003; Callon, 2006), context and content (e.g. Latour, 2005), heavy and light, simple and complex (e.g. Strathern, 2004), micro and macro (e.g. Bruun Jensen, 2004a), society and nature (e.g. Latour, 2005), individual and society, etc. are all variations of what researchers like Latour (e.g. 2005) and Strathern (e.g. 2004) have called scaling and proportioning. Strathern and Latour understand scalings as momentary results of associations. In other words, scalings are the result of certain space-time relationships. These results may become part of what constitutes other relationships, and in that sense take part in enacting other events. But, and this is important, as I take this as my starting point (if one is to be found), researchers that wish to understand the connectedness of the living world cannot start by referring to scales. Scales and other ways of framing the living world and its relationships are what we should carefully and with curiosity scrutinize. In other words, the power to act, to have agency, is understood here as attributed to things. This means that before things can actually be said to be agents (e.g. this is a high building, low performance, a great event, a Western account, an information and communication technology, etc.), they must have agency. Agencies are not naturally given in the order of things, they are accomplishments.

In this thesis my aim is to contribute to the work in ethnographic educational research on relationships between so-called information and communication technologies (ICTs...
Vignette 2: Beware things are gathered!

– in plural) and the everyday living associated with education in the living world. I start by asserting that relationships between ICTs and education are always to be found in the midst of things (Latour, 2005). Relationships are always relationships in-between. Furthermore, I claim that if all things come into being through processes of associations, they too must be particular associations. Thus, this thesis represents research that emphasizes specificities as well as the specificities entangled with those specificities (Moser & Law, 1999). If any thing, no matter how it appears, must always be understood as partially existing (e.g. Latour 1993 & 2005; Bruun Jensen, 2004), then we should tend to those partial existences and examine them as what Orlikowski (2007) calls constitutively entangled:

A position of constitutive entanglement does not privilege either humans or technology (in one-way interactions), nor does it link them through a form of mutual reciprocation (in two-way interactions). Instead, the social and the material are considered to be inextricably related – there is no social that is not also material, and no material that is not also social.

(Orlikowski, 2007, p. 1437)

Latour (2005) suggests that instead of working from the assumption that the social and the material or the social and the technical exist as two aspects of the living world, we should acknowledge that the living world is collectively gathered, and we must attend to the manifold interobjectively coexisting and heterogeneously assembled collectives that are continuously (but never freely) reformed and reforming the living world. Latour’s term of the collective is a weak concept (not a definition) in the sense that Latour does not present a theory about what is and how things are collected in the living world. The collective is yet to be collected; it is uncertain what it is composed of as well as how. Thus, it may appear as one as well as many collectives.

Bruun Jensen (2004b) notes that the emphasis on analytic isomorphism adds that differences as well as similarities are matters of enactments of relationships, and not something we should refer to as qualities that a priori belong to any given substance, material or entity. The way I engage in this research is not by setting aside and favoring any one way to engage with things. As Strathern asks (2004): Who wants research that seeks to understand the world equipped with a worldview?

Researchers like Latour and Strathern encourage us to acknowledge that rather than engaging with perspectives, we are actually both enacting the world and making contexts of knowledge. Thus, when using the word context,\(^\text{102}\) I am not referring to

\(^{102}\) A concept which Latour (e.g. 2005) has thoroughly criticized and at the same time uses on several occasions. I follow Latour’s description of the intentionally weak terminology he uses, which is meant to engage in studies of the processes of mobilizing things instead of being used to frame the things to be
outside factors that influence the object of study. In my approach the different sociomaterial relationships involved in and partially made by this research simultaneously enact the contexts of knowledges and engagements presented here, as well as the object of study. They are parts of the same move. Things become *things* through and not separated from the chains of associations with which research engages.

Latour (2005) has formulated the methodological principle of *following the actors*, i.e. *what circulates*. This principle involves that researchers should also engage with a *processual* approach, which emphasizes that any investigation of things necessarily involves moving the contexts of knowledge and engagements, thus also moving things. However, instead of posing a theory about things and their movements, ANT represents an ambition to continuously *research* and understand things as *being under construction*. All entities are – in this view – to be understood as associations that transport translations (ibid.). While I follow the ways in which the Studynet moves around in relation to the everyday living at Hillerød Business College, I also look at the ways in which the everyday living relating to HBC moves around in relationships with the Studynet as well as other actors. Thus, in math, the Studynet is not the only actor that counts. Many coexisting actors must be considered and many actors constitute the entanglements (or lack of such) of the Studynet with HBC.

**Branching bush types of pathways and technological futures**

Both Latour and Strathern grapple with the condition that any enactment must be viewed as a *momentary* gathering and boxing in, and thus a particular relational accomplishment. Latour’s (1991) statement “… the fate of a statement is in the hands of others” may serve as a way to engage in this challenge. At the nerve of this seemingly simple acknowledgement lies the uncertainty of things. And since the fate of a statement (which may come in many forms) always lies in the hands of others, the unpredictabilities of things are manifold (Bruun Jensen, 2004a). Researchers cannot predict how research will be (un-)folded, schools cannot predict how education will be (un-)folded, and it is entirely impossible to predict what the effects will be of the studied. From this approach – as I translate it – what matters are not words in themselves, and words should not be considered instruments that can be applied but rather be studied in their context of use. I believe that this is why Latour does not seem that consistent in his use of words in his texts. Latour explains (2003) that each text requires its own way of writing in relation to the matters that are being mobilized. In an e-mail correspondence with Marilyn Strathern she also commented that any term – in that case ‘same’ – may become a too blunt instrument: “The idea of fractals refers to fractals as a form, but does not tell you what the content is”. In addition, Strathern suggests that any analogy – in this case ‘fractal’ – “sharpens the original problem, brings it in new focus. In other words, the social phenomena to which the analogy/metaphor is applied still remains, and demands explanation” (Permission for reference given by Strathern. Source: e-mail from Marilyn Strathern, April 13, 2008).
emerging hybridities of, for example, the merger of the Studynet with the everyday living relating to HBC.

Bruun Jensen (2004, p. 115), with reference to STS historian Rheinberger, – raises the central point that the present as a future of the past is not the result of the past; the past is a result of a future. We cannot determine historical developments; we cannot return to what has happened. This is what Latour calls the principle of irreduction (Latour, 2005). The best we can do, if we wish – as Latour suggests (2008) – to follow the branching bush types of pathways related to the movements of things, is to follow them through their processes of mobilizations. Bruun Jensen has followed the mobilizations of electronic patient records as interactively invented, which means, according to Bruun Jensen, that technological futures are not yet boxed in (ibid., p. 131). Both standards and standardizations must be viewed as intertwined in sociotechnical networks.¹⁰³ STS researchers study standards at work and the constructions of standards (ibid., p. 137): “… the reality of a world in which standards have become effective will be the outcome of the successful standardization process …” (ibid. p. 140).

How do we handle complex materials, and how do we engage with acts of collecting and collating the materials describing the complexities we aim to study? As Strathern notes: “What appears to be the object of description – demonstrating complex linkages between elements – also makes description less easy” (Strathern, 2004, p. 1).

Strathern points to description as the difficult part already involving analysis and interpretations. Organizations of materials are matters that relate to both the researcher’s workings and the ways in which the actors whose lives are presented relate and order things. Systematizations and collations are collective but also particular achievements.

Latour (2008) presents a similar argument. He portrays any linear account of the development of things as a product of ways of assemblaging. If we follow the actors during the processes of (dis-)assemblage, Latour suggests, it becomes apparent that depicting progress as a matter of a goal directed trajectory is a partial product of the ways in which researchers depict the complex entanglements and branching bush types of pathways. In other words, both unidirectionalities and multidirectionalities are associated with the ways things are (un-)folded.

¹⁰³ Bruun Jensen refers to socio-technical networks.
Gathering the phenomenon: Moving in and away

While gathering the phenomenon, we make the connections that make things seem comparable (Strathern, 2004). Research involves acts of juxtaposing things – putting things together. Strathern suggests that rather than thinking in terms of comparability, we should think in terms of compatibility. When grouping different existences together under the heading as one, we are engaging in actions making things compatible, but that does not necessarily make them comparable. While being comparable suggests that things contain properties, like e.g. functionalities that are the same, compatibilities lie in the ways “we visualize them” (Latour, 1986, p. 14). Similarities and differences exist inside relationships like being categorized under common labels and functional specifications. In this way researchers may collate things in one place (e.g. specimens of leaves from trees gathered from all over the world) that would otherwise not have appeared together (Latour, 1999a) and also separate things that would otherwise hang tightly together. Proximity, in Latour’s (2005) understanding, does not necessarily mean neighboring things in a geographical sense. What is close and what is at a distance as well as any other forms of scaling is understood as a momentary result of particular ways to associate. The pursuit of understanding forms of existence and their relationships has been conceptualized by Mol (2002) as empirical philosophy. Mol describes empirical philosophy as the praxiographic/ethnographic investigations and questionings of ontologies as they: “… are brought into being, sustained, or allowed to wither away in common, day-to-day, sociomaterial practices” (Mol, 2002, p. 6).

A praxiographic approach emphasizes “… the practicalities of doing …”, e.g. in Mol’s case, disease, and Mol (ibid., p. 31) explains that it is “… a story about practices”. Mol’s work is partially inspired by Strathern and Latour, and she emphasizes that we should understand science/research and all other knowledge-making processes and practices as events – interventions with costs, i.e. as enactments. There exists no objects in the middle that can be researched without simultaneously being translated.

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104 I do not use the term compatibility to suggest the/a way things mingle and become entangled. It does not convey a priori a matter of harmonious combinations, a matter of things mixing without changing or existence without mutual interferences. To me, compatibility indicates processes of entanglements and coexistences without suggesting their forms. While compatible may be understood as the capability to mix without separation, this may, in the way I use it, just be a variation of compatibilities. Joining together and breaking apart may take part equally in processes of making compatible. While comparing involves putting things together – aligning things, compatibility lies in the ways alignments are made to function. Comparing can be viewed – in this sense – as a variation of compatibility. The lexical meaning of compatible is sufferable, tolerable, and endurable. Com means with or together. Thus, to be compatible also means to endure together, to suffer with and become tolerable together. In other words, coexisting takes effort and has costs. Other variations would be to think in terms of encountering, meeting and to be matched. We need to engage more in the variations of coexistences and interobjectivities – the constitutive entanglements – ontological choreographies – and ontologically multiple assemblages of the living world.
Vignette 2: Beware things are gathered!

Ontologies

According to Mol, Strathern and Latour, it is a basic condition that there exists many different variations of any one thing gathered – depending on the ways they are being gathered, engaged and referred to. These variations (innovations) are part of the (most common) ways to stabilize things. The rare occasion is when things become standardized (stand still/frozen) and move between entanglements unaltered. Latour (1999a) describes the double move of science as both moving in and moving away from things. Sciences both adds and subtracts. Things that are being held together through processes of (dis-)entanglements are what Latour (1999a) refers to as actors, things, mediators, actor-networks and circulating references. Circulating references – in Latour’s (1999a) example of the Amazon forest soil – are held together through processes of translations that continuously alter the ways in which things are being contained as well as what is being contained – in other words what things refer to. Thus, circulating references are things that are transported through and transport translations. Attending to these movements is also to keep alert towards what Mol (2002) refers to as the mutual inclusions of things, which I believe is what Latour refers to as the partial coexistences (2005a) and interobjectivities (Latour, 1996) involved in the ongoing fabrications of things.

Mol, Latour and other STS/ANT researchers emphasize “… the art of never forgetting about microscopes …” (ibid., p. 31). Star and Bowker write: “In general, the trick is to question every apparently natural easiness in the world around us and look for the work involved in making it easy” (1996, p. 6). They also make the argument that we can only access the past through classification systems that help frame our representations of the past in the present. The art of never forgetting about microscopes lies at the heart of STS/ANT research, and should not be understood as thinking in instrumentalist terms of singular research instruments like microscopes defining/determining research results. Never forgetting microscopes should instead be understood as an analogy to the entire machinery of partially existing assemblages and ongoing movements of things involved in the processes of doing research and making things things.

Ontologies come into existence through processes of objectifications (Callon, 2006). Through these processes, matters become translated into forms (Latour, 1999a) that may in turn become forms that take part in forming matters, for instance, in Latour’s example (ibid.) in which soil samples are put into plastic holders that then take part in forming the soil samples as matters that can be studied. Latour describes these processes as processes of translations and associations that continuously add (make more real) and subtract (make less real) from the matter. Through processes of translations, connections between things that used to be separate become enacted (Elgaard Jensen,
Vignette 2: Beware things are gathered!

2005). Connections are constructions. Processes of translation mean transformation of things in ongoing practices. In general terms the analytical strategy of ANT is to follow these processes of translations (Elgaard Jensen, 2005). ANT sets out to investigate how things become things that matter (or not).

Whenever things are described – have been made describable, that is – they have in a sense become less complex and more complicated (Latour, 1996). Any description necessarily involves both adding and subtracting (Latour, 1999a) relations. If we take our point of departure in Latour (2005) and Strathern’s (2004) claims to the world as being equally complex, then all we can do is to complicate things by presenting them partially. The question then becomes: How do research/practices complicate things?

The representation of things as momentary gatherings influences what becomes present(ed) by research. Research relies on entanglements (rather than distance) and the entanglements may be much more incidental and at the same time central than we tend to imagine (Strathern, 2005). This, however, does not imply (in my sense) that entanglements are random. But it does suggest that entanglements are relational matters, which come into existence inside the ongoing translations of things (Latour & Hermant, 2006). Entanglements may not, Latour and Hermant suggest, be visible inside images but inside the different translations between images. The authors suggest that to see is to circulate – in other words to move.

Variations of descriptive and practical framings of things

When describing and understanding technologies like the Studynet, we may take our point of departure in a variety of approaches. As mentioned in Chapter 1, Latour (2005a) distinguishes between objects that have been thrown out of the political sphere, and objects as things. While the former refers to the imaginary of objects as autonomously existing, the latter refers to the imaginary that any object is brought into existence through practices of (dis-)assemblaging and representation. In other words, acknowledging all objects as things means taking seriously that all things become things through processes of objectifications (Callon, 2006), i.e. that any thing (also autonomous objects) is a momentary sociomaterial effect of particular ways of gathering matters of concern.

When pursuing an investigation that addresses the question of How does a knowledge sharing system – called the Studynet – become part of and take part in moving the everyday ways of living associated with the secondary school programs at a Danish business college?, it makes a big difference which conceptualization of objects is being
referred to. In Latour’s understanding, all objects are actors – that is mediators.\(^{105}\) This means, that objects through processes of objectifications are made to be things with agency. To understand objects as autonomously existing and (a)political is another way of objectifying things. This descriptive and practical framing of objects will influence the research and practices it engages with. Autonomously existing objects do things and have agency, thus autonomously existing objects are things that are already determined. Even though neither NNIT, Microsoft nor HBC’s head of quality and communication believe that the Studynet is a standalone system, their presentations suggest that it is a platform to move from. This enactment does not determine the ways practices with the Studynet unfold, but it is a practice that partakes in some of the practices that mold the Studynet as an actor in relation to HBC. I have deliberately collated Chapter 1 and Chapter 2 in the thesis to convey a sense of two coexisting variations of enactments of engagements with the Studynet that I find analogues to Latour’s depiction of the two kinds of objects. Both – in my sense – are included in the understanding of objects as things (yet to be determined) that is represented in this thesis. As later chapters will illustrate, whether engaging deliberately in either one of these ways to enact the Studynet, the result always partially exists. As Strathern (2005) notes, relationships partially make things things. And as Latour (1991) states, these are always in the hands of others. As the later chapters will illustrate, the ontologies of everyday living relating to the Studynet do not follow from strategies, a learning culture, the Studynet or any other individual entity. But either one may become part of and emerge as momentary results of the emerging constitutive entanglements involving the Studynet.

Objects as things entails that no objects exist outside the collectives that make them work (de Laet and Mol, 2000). Since the specificities of the collectives that make objects work vary, we may talk about things as being partially fluid (ibid.). In this understanding we can think of the Studynet as an ontologically multiple and perpetually mobile object because it continuously becomes differently entangled in manifold everyday living and relationships (relating or not relating to education).

This thesis is concerned with analyses of the multiple ontologies inside which the Studynet becomes an actor multiple (Mol, 2002). De Laet and Mol’s (2000) analyses of the Zimbabwean bush pump – a water pump – as a partially fluid technology means that it is both solid and mechanical, and yet it’s boundaries are vague and moving. The authors refer to the Zimbabwean bush pump as a fluid technology and introduce the

\(^{105}\) I understand Latour’s term mediator as an attempt to engage in a vocabulary that moves from nouns (i.e. a medium) to verbs (to mediate) in order to emphasize that it is a matter of activity, engagement and processes. The term mediator, also suggests that we are simultaneously dealing with an actor – something that makes a difference. As mentioned in Chapter 1 in relation to Latour’s tale about the two twin travelers (the time-space and the space-time traveler), a mediator may become a medium/intermediary – something in-between/a channel – which we more or less take for granted.
pump as having the quality of being fluid. They describe the fluidity as “its fluidity” (p. 225). This could be understood as just another way of saying that this is an object with agency. This, however, is not de Laet and Mol’s errand; the authors describe the fluidity as part of the ways in which the pump contains its environment within (as opposed to being an existence in a surrounding environment). You could say that its adaptabilities are neither to be found in an outer environment nor in the pump, but in the ways that the pump becomes attached with variations of everyday living as it is moved around. In this sense the fluidity is to be located in the ways in which it becomes an environment within environments. And – the authors warn us – fluidity is not in and of itself a good thing. Rather it signals that things move, and with those movements follow translations of what may be good and bad ways of working, i.e. functionings.

I find de Laet and Mol’s descriptions of the Zimbabwean bush pump as partially fluid because it is variable over time (ibid., p. 228) analogous to Latour’s (1999a) analyses of researchers’ efforts to sample the Amazon forest soil. While Latour’s analyses illustrate the processes of translations involved in the shifting specificities involved in processes of assembling a research object like the Amazon forest soil, de Laet and Mol’s analyses illustrate the shifting specificities involved in making the Zimbabwe bush pump work. The two analyses illustrate the two coexisting environments of this research: 1) as a research object, the Studynet becomes part of the processes of assembling and making this research work, and 2) as a technology at Hillerød Business College, the Studynet becomes an object that is made to work with the everyday living associated with education. Thus, this research engages with several workings of the Studynet, and engages the Studynet in multiple relationships.

Latour’s example shows that during processes of collecting and collating research materials such as soil samples, researchers’ instruments (i.e. maps, branches, rusty nails, tin tags, and numbering) take part in putting things in formations. De Laet and Mol’s bush pump example shows how putting technologies to work also involves adding and subtracting things along the way. The authors furthermore illustrate that technologies like the Zimbabwean bush pump may be viewed as nation builders and nations as technology builders (ibid., pp. 234-35). Another way to phrase it is: Both nations and bush pumps may be viewed as partially coexisting technologies, neither of which exist autonomously. The same point is made differently by Latour: Both research and research objects may be viewed as partially coexisting. But they are ‘only’ partially engaged/engaging and thus also partially contributing to the construction of one another. Or in the words of Strathern (2004), they may be viewed as both partially contained by as well as partially containing each other. While Latour’s example illustrates research as assemblage work, de Laet and Mol show that many shades of working things exists. Furthermore, they argue that apparently standard things do not
Vignette 2: Beware things are gathered!

stay the same anytime, anywhere in order to work. Rather, the strength of these
technologies may be their partial fluidities. Both Latour and de Laet and Mol show that
different circumstances enact different variations ‘of’ things, and that any description
thus also engages with a variation of things.

In my analyses, I follow de Laet and Mol’s methodology (ibid., p. 237) of descriptively
and practically framing the Studynet in a range of different ways. Each way contributes
to a different understanding of the Studynet and how it is made to work through shifting
relationships, as well as what it may mean to put an object multiple (Mol, 2002) like the
Studynet to work in education. Shifting the descriptive and practical framing of the
Studynet is also what I refer to as moving the contexts of knowledge and engagements.
I do this in different ways, e.g. by following the Studynet in relation to math activities in
relation to different instructional activities like handling assignments and in relation to
teachers’ activities revolving around structuring, planning and communicating about
instructional activities. I also follow the Studynet as it becomes mobilized through
processes of representing the Studynet in school strategies, introductory courses and
workshops. In other words, the analyses take the reader through examples of the ways
in which the Studynet becomes a partially existing actor in relation to the everyday
organization of things at HBC.

Chapters 1 and 2 revisited

One thing is to claim that in the analyses I am engaging in shifting ways to describe and
practically frame the Studynet. But what does that actually mean? The method bares
resemblance to Latour’s (1991) analyses of the ways in which a hotel key becomes an
actor that carries out the program: Leave the key at the desk! The central difference may
be that at HBC no clear programs exist that needs to be realized with the Studynet.
Furthermore, a key is a much more tangible object than the Studynet, and what it means
to work with the program “leave the key at the desk!” is quite different than working
with and engaging the Studynet in the everyday living at HBC. While certainly referring
to something else, as an analogy it nonetheless serves the purpose of sharpening my
argumentation.

Working with and engaging the Studynet in the everyday living at HBC could be an
equivalent to the key program. But as we have already seen in the math example,
working with and engaging the Studynet in everyday living may not be the program.
And perhaps what is more important, it should not necessarily be the program. While
Latour’s key example involves an act of persuasion into a particular engagement with
the hotel key, I do not engage in a project that takes its point of departure in ways of
persuading actors into particular engagements with the Studynet. I aim to study
(dis-)engagements with the Studynet without a predisposed concern towards which engagements may be better. Therefore, when I relate to Latour’s key example I do not see it as being the same as what is the matter of concern here. I use it as a way to engage in the description of the method of analyses engaged in the two first and later chapters.

Latour (1991) refers to the concept pair of *associations* and *substitutions*. As I understand Latour’s key example, it is an illustration of processes of substitutions and associations – in other words, processes of translations – that are involved in making innovations. Part of Latour’s argument is that all processes of associations involve processes of substitution, and this means quite literally the transformation from one variation of things into another. In the following, I illustrate how my assemblages of chapters 1 and 2 also involve certain processes of association and substitution. I believe that this provides a different access for seeing how I make things work in this thesis.

Chapter 1 summons several actors, for example, the HBC Frederikssund school + math teacher + Mathcad + equation + paper + classroom + computer room + computers + Internet + papers + pencils + Studynet + students + assignments + …

The movement from Chapter 1 to Chapter 2 may, as Moser and Law (1999) suggest, be viewed as a movement between specificities, and this movement is a passage that is a specificity ‘itself’.

Chapter 2 summons different actors from Chapter 1, for example,: Microsoft + NNIT + head of quality and communication + articles + yellow pages strategy + one platform strategy + Studynet + …

Thus each chapter and the movement between chapters involve several movements of association and substitution. While each chapter is described as being partially about the Studynet and its constitutive entanglements, it is also about the many other actors, each of which contributes to making, or not making, the Studynet an actor. Each actor may be viewed as becoming part of the environments within in relationship with which the Studynet is partially made to work. The movements between chapters thus illustrate a variation of what I call moving platformations in Chapter 2.

If we look at the movements involved in going from Chapter 1 to Chapter 2, we can see that all the actors are substituted except for the Studynet. Chapter 1 and 2 are not represented (here) as if they are realities with many actors in common. But as later chapters will illustrate, the yellow pages strategy and the one platform strategy become part of ‘other’ teachers’ ways to engage with the Studynet.
If we look at the one platform and the yellow pages strategies that are presented in Chapter 2, they may appear to have nothing in common with what it means to enact the Studynet as an actor in math, but this does not mean that they do not affect things. This is concretely manifested in the closing down of teacher homepage domains, and limiting student access to Hotmail.

Thus, this is another way of establishing relationships with the Studynet with clear costs to some of the actors in everyday living. It is, however, not something which can in and of itself be credited to the Studynet. Let us look again, in-between the activities at HBC – as later chapters will elaborate – and another passage appears. The passage between:

HBC + teacher homepages + student access to Hotmail at school +…

Or

HBC + Studynet +…

This is another example of processes of substitutions and associations involved in the engagements with the Studynet in everyday living at HBC.

While the first passage illustrates how movements between chapters enact passages between the specificities of constitutive entanglements involving the Studynet, the second passage illustrates how the introduction of the Studynet to the everyday living at HBC involves processes of associations and substitutions. I see the concepts of association and substitution as another way of saying that any connection is another disconnection (Strathern, 2005).

The enactment of HBC as the platform of things involves (at that point at HBC) partially going from several to one place for things. This is a kind of working that raises the important question: Is this an appropriate approach?

To engage with the specificities and passages between specificities (Moser & Law, 1999) in everyday living is what I call moving contexts of knowledge and engagements. I do not insert what movement, contexts, knowledge or engagements mean. It must be a relational matter. My aim with this thesis is to illustrate ways to engage with this moving approach, and how these knowledge practices may produce different knowledge as well as grounds for knowledge than ‘other’ knowledge practices currently influencing e-learning research (elaborated in Chapter 6).
In Chapter 1 we also saw that many different passages between specificities were enacted: Passages between the teaching classroom and the computer room, passages between doing math with paper and pencil and Mathcad, Equations, Word, the Studynet, etc. Each passage is, however, not to be understood causally as a passage between autonomously existing objects, as Moser and Law (1999) argue; each passage is a specificity and each specificity moves in-between specificities. This is what I call the awareness of in-betweennesses, which I consider a methodological key in ANT oriented research.

Engaging in the moving contexts of knowledge and engagements enrolling (or not) the Studynet as an actor is an example of what Latour refers to as following actors (that are always actor-networks). Following actors as they become partially engaged in working nets of actors means following the way things move and become moved partially. Latour’s key example is an illustration of his claim that any statement is made to work through processes of partially adding (associating) and subtracting (substituting). Therefore, it is important to tend to the machineries involved in these movements. They have costs. Every time we move things, e.g. by adding another chapter, technology or strategy, we do not go to an entirely different place, but we move relationships and the grounds partially in relation to how we may partially engage (with) things. Thus, what becomes the grounds as well as the relationships we include and exclude is a highly political matter (Latour, 2005 & Mol, 2002). Chapters 1 and 2 illustrate that my movements between these different contexts of knowledge and engagements related to the merger of HBC and the Studynet also invite, or do not invite, particular relationships into my research. In other words, this is a third passage to consider.

The challenge of research is that any gathering is another way of dissembling and disassembling things. Whether we do this intentionally in order to reject other ways of assembling things, or whether we do it in order to understand ways to gather, this becomes an unavoidable basic condition. Research enacts landscapes; the question is which landscapes are included and excluded and at what cost?

**Ontological multiplicity and the politics of what**

When understanding the living world as ontologically and multiply produced (Mol, 2002), studying the continuous productions of what Cussins (1996) has called ontological choreographies becomes necessary. Orlikowski (2007) calls for engagement in constitutive entanglements. One of the central propositions made by ANT is that if the world is ontologically multiple, then realities/world-makings are highly political (e.g. Mol, 2002), because other variations possibly exist and may be enacted. Enactments of realities, however, are always particular workings, and thus not just a
Vignette 2: Beware things are gathered!

matter of free will, choice and perspectives. World-making is presented here not just as a matter of multiple (subjective) perspectives on one and the same objective world. Researchers participate in world-making. This is why Mol calls for both a “politics of who” and a “politics of what (a politics that includes ontology rather than presuming it)” (Mol, 2002, p.184).

** Movements, visibilities and space-timings**

Any engagement in acts of gathering research/practices also engages in moving the contexts of knowledge and engagements and thus also (in-)visibilities. What becomes visible in one relationship may not become so in another. Comparisons and references lie at the heart of all movements. Movements can be understood as contrasting/oppositional/revolutionary/conflictual/paradoxical/evolutionary/complex/multiple/singular/referential/interobjective/partial, and as translations/representations, etc. At HBC what is past, present, and future continuously emerges and moves inside variations of shifting relationships.

In *Paris: Invisible City*, Latour and Hermant suggest that transformations charge with reality:

> Let’s rather say that the visible is never in an isolated image or in something outside of images, but in the montage of images, a transformation of images, a cross-cutting view, a progression, a formatting, a networking. Of course, the phenomenon never appears on the image, yet it becomes visible in that which is transformed, transported, deformed from one image to the next, one point of view or perspective to the next.

(2006, p. 29)

In between moving entanglements, parts of the everyday living relating to HBC become (in-)visible. When we look at research findings, we mostly do it in the form of inscription devices such as research reports, scientific articles, etc. Thus, when we look at conclusions (the ends, as Strathern states), we look at the momentary end results of numerous processes of gatherings involving entanglements and passages in-between entanglement which are rarely explicated in the texts. Even when engaging in making these movements explicit a new problem quickly arises: How can we slice and encompass things in writing? When engaging in research results, we should be careful not to *jump* (which is another way of moving) too easily to conclusions about the relationships ‘of’ things that we imagine to be the *same* but in multiple ways may in fact not have much in common other than the relationships we establish.
Vignette 2: Beware things are gathered!

With this in mind, I continue in Chapter 3 with engagements in shifting descriptively and practically between moving contexts of knowledge and engagement partially involving the Studynet.
CHAPTER 3: (RE-)CONFIGURATIONS

Passages between the space-timings of ICTs and HBC

Chapter 3 moves partially with chapters 1 and 2 and partially with vignettes 1 and 2. However, Chapter 3 and the following chapters also gradually start involving different resources related to research on and representations of relationships between ICTs and education. These resources are manifold and are referenced as a way to (un-)fold what may be the partial contributions of this research to ‘the’ research fields, which also carry various names, such as e-learning research and instructional technology research. In Chapter 3, we meet Sarah, who is a teacher in the basic vocational program, and Peter, who is a teacher in the upper secondary program. Sarah and Peter have both been working with dedication towards making the Studynet compatible with their everyday teaching activities as the platform for things. They have both focused on handling assignments based on the so-called “Assignment” and “Delivering Assignments” functionalities in the Studynet. Furthermore, they have engaged in moving their previous homepage engagements and activities to the Studynet.

This chapter enrolls the interviews with Sarah and Peter in a discussion of remediation, a concept introduced by Bolter and Grusin. It also illustrates how Bolter and Grusin’s concept of remediation – often referred to in e-learning research – may in fact be misleading (if taken as a general point of departure for explaining things) as it too easily leads to the assumption that engagements with ICTs are either about doing something new, better and more effective (shifting out) or that they are a simple matter of remediation (association) – that is old wine in new bottles. Interviews with Sarah, Peter and Laura, another upper secondary program teacher, and conversations with Vivian, the head of the basic vocational programme (HG), show that the Studynet is not just another way of doing things the same way, e.g. handling assignments by other means, and it is not just another better, easier and more effective way either. What is new and what is old continuously move and coexist partially inside the specificities of

106 Picture of the school on the street called Trollesminde Allé.
the merger of the Studynet and the everyday living involved in handling assignments in HG. This merger involves multiple partial passages between things. It is argued that describing these passages as matters of either the old in the new, the new in the old or something entirely new (as Bolter and Grusin do) is one way to describe and enact the relationships involved in the movements of everyday living with ICTs. It is, however, not a description and enactment of movements that fits very well with the complex movements and relationships involved at HBC.

The chapter concludes by suggesting that while Bolter and Grusin’s analyses work from a theory of remediation as a general matter, engaging with a relational and complex concept of movements in everyday living that does not assume to begin with the relationships of things and their space-timings (i.e. what is old, what is new, what contains media and how media contains things) may be another methodological key to be used to research the Studynet as an actor as well as the movements associated with the Studynet in the everyday ways of living associated with HBC.

Research information

In the 2004-2005 (mostly) and 2005-2006 school years, I visited HBC regularly and engaged in a variety of activities related to the everyday living associated with HBC. I also engaged in what may be called more formalized methods of inquiry, including semi-structured interviews with four students and six teachers in the basic vocational and upper secondary programs, four of whom were E-learning Group members, as well as interviews with the heads of the academy and basic vocational program. I also engaged five students in the writing of digital logbooks. In addition to

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107 To mention but a few: I participated in eight monthly E-learning Group meetings from August – November and January – April 2004-2005, gave a speech about e-learning at the second E-learning Group meeting, arranged virtual discussions in the E-learning Group, did observations of instructional activities with(out) ICTs, carried out informal ‘hallway’ conversations with various actors, conducted ‘walking around’ observations, shadowed activities involving the Studynet on-line and off-line, generated reports with screenshots of on-line activities approx. every other month from October 2004 to January 2006, followed students for the entire school day, participated in a Committed-to-Excellency meeting, a Student Plan conference, meetings with IT support staff, progress meetings with the e-learning coordinator and head of quality and communication, ate lunch with teachers and participated in breaks with students, e.g. I dealt the cards in a poker game.

108 On the ways in which ICTs took part in their everyday living related to as well as unrelated to their engagements with HBC. The interviews lasted as long as it took to talk about these issues or as long as the interview participants were able to participate. The recordings last from 45 minutes to 3½ hours. Some of the interviews were split into two parts over two days. Every interview was recorded with a digital dictaphone. In addition, less formal meetings and conversations were recorded when possible.

109 Avril from HHX3a and Noah, David and Michael from HHX2a.

110 Six HHX teachers (Andrew, Seth, Cathrine, Laura and Peter) and one HG teacher (Sarah).

111 Hillerød Business College also consisted of industrial academy programs.

112 Philip HHX3a five days, Noah HHX2a fourteen days, David HHX2a fourteen days, Michael HHX2a fourteen days and Maria HG26 fourteen days. The logbooks were about the ways in which ICTs took part
shadowing the Studynet\textsuperscript{113} as it became (dis-)engaged in variations of activities, I followed the classroom activities of four teachers\textsuperscript{114} and three students\textsuperscript{115} for entire school days.\textsuperscript{116} Both males and females\textsuperscript{117} are represented in the study, though I have not made gender issues a special concern. The empirical material also includes telephone conversations and more or less formal meetings with teachers, the head of quality and communication, IT support, the e-learning coordinator, a VET consultant and an upper secondary school consultant from the Danish Ministry of Education. In addition, apart from holding an introductory meeting presenting the project to the

in their everyday living related to as well as unrelated to their engagements with HBC. The students could choose to do audio/video recordings or take pictures, and they were encouraged to take screenshots of their activities. All but one student put their descriptions in writing and used screenshots. One student (Michael) also took digital pictures of his activities outside of school. I gave the students a document explaining their participation in the project which they could use as a reference in their CVs. Furthermore, all the students received a Microsoft program called OneNote as part of writing the logbook. Using OneNote, I prearranged a structure for the logbook to guide their writing, but they were told to do it in whatever way they found most comfortable. They could also choose to write it using something else. They were told that they did not have to write, but that they could do audio/video recordings or use whichever way suited them best. One student – Michael – also received Office2003. To begin with, each of the students was promised a letter of reference. Because the students participated in interviews, wrote logbooks for fourteen days and let me follow them around, they were also given an Xbox game or Office2003, if desired. Each student decided individually how he or she was going to participate as well as the extent of the participation. It is important to note that none of these activities were used to promote the project or Microsoft’s products. This was thoroughly emphasized to the students. My objective was to take advantage of the opportunities I had to give something back to the students, who spent a great deal of time on the project. Especially the letter of reference was a way to positively help the students in their future careers, educational or otherwise. According to the students (both before and after), they participated because they found the project to be interesting and because getting a glimpse of what it means to do research was exciting. Everyone agreed that they were willing to be contacted again, and a few of them have also contacted me since, e.g. via Messenger, after participating in the project.

\textsuperscript{113} Inspired by Bruni (2005), I use the concept of shadowing. Bruni explains shadowing software as a type of observation that understands the research ‘object’ as an ‘emerging subject’. He writes: “... shadowing the EPR [Electronic Patient Record], letting the software guide me through the organization and confront me with other actors and processes, whether human or artificial” (2005, p. 363).

\textsuperscript{114} My research did not include a specific agenda for how many lessons, which teachers, subjects, activities or where in particular the everyday living at HBC would be observed. I was interested in getting a ‘sense’ of the manifold everyday living associated with HBC, including activities with and without ICTs. The classroom observations I did on teachers included: Peter in IT/HHX (one HHX2e and HHX 2d IT-b lesson, September 8, 2004; one HHX 2e and HHX 2d IT-b lesson, October 27, 2004; one HHX 2e IT-b lesson, November 24, 2004; one HHX 2d IT-b lesson, September 8, 2004; one HHX 2e math lesson, November 25, 2004; one HHX 2f IT-b and mixed math class HHX 1e/1g lesson, November 25, 2004); Seth in IT/HHX (1 HHX 2a IT-b lesson, November 24, 2004; one HHX 3 IT-a lesson, November 24, 2004); one electives day with Ken, the HG electives teacher, January 11, 2005; and one HHX 2a project day with John, the history teacher, April 25, 2005.

\textsuperscript{115} One day with Philip, HHX 3a, January 13, 2005; one day with Maria, HG26 project day, February 25, 2005; and five consecutive days (not counting Easter break in between) with Michael, HHX 2a, March 15-17 and 29-30, 2005.

\textsuperscript{116} Originally, I had decided to video record observations, but quickly abandoned this practice because I had to move around too much and the actors I was following moved around too much. In addition, the actors involved materials and ways to partially connect that cannot be captured by a video camera.

\textsuperscript{117} The engagements with the different human actors may be viewed as a result of emerging possibilities rather than a plan/strategy. For instance, through the teachers in the E-learning Group, I met other teachers, and still others when following students around. The students heard about the project e.g. when I observed teachers and invited students to participate in the project.
students, I chatted and text messaged with the six students about their participation in the project. One girl in HHX3 also chatted with me about her school assignment. Another girl in the basic vocational program came up with the idea of writing a report on her experience using ICT in relation to her studies in the program. A large variety of different materials have been partially included in the data collection related to this research, i.e. audio recordings, video recordings, observation notes, digital pictures, screenshots, e-mail correspondence between teachers and IT support and/or the head of quality and communication, e-mail correspondence between me and the different human actors, documents on HBC’s knowledge sharing strategy, materials located on the Studynet, for example, assignments, messages, discussions, the school’s annual satisfaction surveys, articles on HBC’s introduction of the Studynet, etc. Unfortunately, not all of these materials or the many different issues that matter at HBC can be included or are referred to in the thesis. All of them have nonetheless contributed to this research in one way or another.

This chapter enrolls, for example, interviews and conversations with teachers, in particular, the following commercial upper secondary program teachers: Peter, Laura and vocational program teacher Sarah. Other items enrolled in this chapter include Peter’s e-mail correspondence with IT support, screenshots of Peter’s activities, screenshots associated with Peter’s presentation of his movements from Studynet homepages, and conversations with vocational program leader Vivian.

First story: From where and where to?

During the interview also described in Chapter 1 with the math teacher, Andrew mentions that he is going to take the Danish pedagogical IT license called EPIT. The license was developed as a course for vocational college teachers in order to assist them in the pedagogical integration of ICT in their teaching. Most teachers at HBC have already passed the EPIT. Andrew explains that he sees the EPIT as primarily a way of getting a new laptop computer with Internet access. He is not convinced that the EPIT will contribute to his engagements with ICT in teaching. During the 2004-2005 school year, I met several HG and HHX teachers who said that they were going to take the

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118 I deliberately asked the students to help me find out how I could research the ways in which ICTs took part in their everyday living. I let them decide which media they wanted to use to communicate with me. Furthermore, I let them decide how they wanted to participate in the project. One student (Avril, HHX3) did not do a logbook but participated in an interview; another student (Maria, HG26) did not participate in an interview, but she did do a fourteen-day logbook and write a report on IT in HG as well as let me follow her on a project day in HG. One boy (Philip, HHX3) did a five-day logbook and let me follow him for a day in HHX3. David and Noah (HHX2a) did fourteen-day logbooks and participated in interviews. Michael (HHX2a), apart from participating in interviews, did a fourteen-day logbook and let me follow him for five consecutive days in school.

119 Different variations of this exist e.g. for HG and HHX teachers.
EPIT and receive a computer, but that they did not see how the license was related to their activities. None of the teachers I interviewed felt that EPIT prepared them for what the *present situation* at the time was or for the challenges involved in integrating the Studynet in their teaching at HBC. The head of HG – I will call her Vivian – states that most HG teachers have already been engaged in EPIT. In combination with input from teachers in the E-learning Group, her impression is that EPIT has (so far) focused on the *Internet* and *homepages*, while HBC, at that time, was engaging with the Studynet, which is something else. Furthermore, in several interviews, e-mail and homepages are described as *the* ways of communicating in relation to ICT in the everyday organization of things at HBC. Thus, introducing a new actor like the Studynet is a challenge to the educational actors. It is a challenge inside the relationships with which they have been and are momentarily engaging with.

The everyday living related to HBC is not characterized by longstanding and common/shared traditions for using ICTs, and the different coexisting practices are not necessarily articulated in the organization. Vivian explains that a short *four years ago*, they were hardly familiar with ICT as a tool in the administration and everyday organization of the education.

I received an empty computer. There were no instructions, no structures, and no manuals. Nothing at all. I found some handwritten plans, sort of like the kind you do for your household finances. IT has taken on a much greater role. We only communicate digitally now in this department. It has REALLY increased. It is an interesting process … The teachers want a high level of information. Of course we need to sort things, but all communication is happening through e-mail. And the amount of information is large. This creates the question of whether Outlook is the right media. When I read about all the different communication options … I believe that I am getting to a point where I could use some more options …

Before Studynet they used Outlook as their main tool for communication in the organization, and each teacher had his/her own homepage. Many teachers designed their homepages when they took the EPIT. Both HHX teachers, Peter, who has been teaching IT for many years, and HG teacher Sarah, who has been engaged in several development projects and who has also been teaching IT for many years, are currently engaged with EPIT when I interview Sarah in April and Peter in May 2005.

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120 Recorded conversation with Vivian, head of HG, conducted by Hansbøl, June 8, 2005.
122 I.e. with the KVU head, Peter, the HHX teacher, Sarah, the HG teacher, and Vivian the head of HG.
123 Recorded conversation with Vivian, head of HG, conducted by Hansbøl, June 8, 2005.
Chapter 3: (Re-)Configurations

Sarah: I’m engaged with EPIT at the moment; I am almost finished. But it’s about homepages, and I already know how to do that … Development has overtaken it [EPIT]. At the same time as we started at EPIT, we got the Studynet. To begin with, we were supposed to make homepages here [at HBC], and use them as our communication tool and to structure our communication with students, and I’ve had my own school homepage for several years.  

The experiences of teacher and leaders are related to the practices they are engaging with at the moment. EPIT currently does not appear to be contributing radically as a source of inspiration to the specificities of everyday living with ICT integration at HBC. The current challenges with ICT integration refer to the Studynet. However, the current everyday living at HBC is influenced partially by the teachers’ previous engagements with EPIT. One example of this is that many teachers have made their homepages while taking the EPIT.  

The Studynet may not have ‘landed’ in the midst of already stable, well-established communication and structuration practices with e-mail and homepages at HBC, but certain passages between these specific engagements with ICTs and the engagements with the Studynet emerge. The above quote from Sarah articulates this passage between homepages and the Studynet. Laura, an HHX teacher who teaches business economics and marketing, also comments on this passage between homepages and the Studynet:

Laura: … I did engage with homepages through EPIT … But … I don’t really know what to use it for now that we have the Studynet … We do not need it now, because everything is collected there in one spot. We have been making homepages, but they are irrelevant in relation to the Studynet. The one we made for the EPIT fades out.  

Mikala: Have you made a homepage that you can use as part of your teaching activities?  
Laura: Yes.  
Mikala: But you don’t use it anymore because of the Studynet?  
Laura: Yes, but I don’t use the Studynet instead, because I haven’t gotten around to it yet. Maybe [in relation to EPIT] the option of using our own system [the Studynet] should have been considered. But EPIT is not flexible enough for us to be able to do that.  

At the time of the interview with Laura, I become aware of this passage and start questioning what it actually refers to. I ask Laura why she did not e.g. link to her homepage from the Studynet and what it is that makes their homepages so incompatible with the Studynet:

124 Interview with Sarah, an HG teacher, conducted by Hansbøl, 28 April, 2005.  
125 Another example is when teachers mention that they have made PowerPoint presentations to teach their classes.  
126 Interview with Laura, an HHX teacher, conducted by Hansbøl, 27 April, 2005.
Laura: I suppose you’re absolutely right. Nothing makes it incompatible, but we’re probably taking the approach now that we do not want to do that anymore. We’ve tried that and now we have the Studynet. We think: Why use two different systems when you can settle with one? Running everything from the Studynet is what we think we should do.

Laura also mentions that the homepage has the HBC domain, which she is not sure still exists. The HBC domain was later shut down in the course of the merger between HBC and another vocational college. As part of the *one platform strategy* approach to the implementation of the Studynet, all of the teachers were asked, as already mentioned, to no longer maintain a homepage – which was considered an extra element – in addition to using the Studynet. Everyone was asked to dedicate their activities to the Studynet.

Sarah explains that she has had several homepages with example courses, for example, an introduction to editing pictures. She has also stopped using homepages now and has instead engaged with the Studynet.

Sarah: I had conversations with John [head of quality and communication]. I was upset that we had to move to the Studynet because I had finally made it work [with the homepages] and gotten the students used to it too. We talked about me eventually finding ways to move my things from the homepage to the Studynet. So that’s what I do. But it means that I have to put it inside the structure of the Studynet. I could make a link to my homepage, but I haven’t done that because then I would have things in several places and that’s not practical.

Mikala: Can you picture … inside the Studynet being able to … it’s nearly made up of numerous little homepages …

Sarah: I have many classes. I like the homepage structure better. It’s more flexible than the Studynet structure. If I do it for one class, then I need to do it for every class.

Sarah explains that this year (it varies from year to year in HG) she is teaching two IT classes, one first-year and one second-year, two English classes, and one social studies class. She is also in charge of doing graphic presentation courses, electives courses, administration and casework, language and culture and three to four presentation courses with IT as basic subject and IT as case. Electives courses are intensive fourteen-day courses where teachers sometimes have classes they do not teach otherwise. IT, English and social studies are basic subjects, and the rest last one to two days depending on the circumstances. The presentation courses target primary school students and last three days.

Both Sarah and Peter are members of the E-learning Group, and they have spent a significant amount of time engaging with especially the Assignment and Assignment Delivery functionalities of the Studynet and with reporting their experiences to the IT
support. In the first interview\textsuperscript{127} with Sarah we talk about her experiences concerning her engagements with the Studynet in everyday activities, the E-learning Group and IT support. Sarah explains that the activities in the E-learning Group are similar to most development work and that practical work has been carried out in some places, i.e. ‘in classrooms’, while the development work has been carried out elsewhere, for example in the E-learning Group. The problem is making things interact together. Sarah, who has participated in many development projects, defines it as a known problematic.

Sarah: … it is important to discuss pedagogy, but sometimes the everyday living we deal with is so difficult that all you can do is focus on making it work.

Sarah has experienced numerous non-workings in relation to the Studynet. She reports them to IT support, but one challenge that she faces, according to her, is that they respond by saying that they will have to wait and see how many people experience the same problem. They cannot intervene simply because one person experiences things in a certain way.

Sarah: We always lack the connection between individuals and groups. In the case of specific Studynet failures, for instance with the schedule, then they either correct the problem or send me an e-mail stating that this is just the way things are.

General and particular (in-)visibilities

Another possible subheading for this section is: How to make sense of this?

\textit{Screenshot of an HG class site with apparently no activities.}

\footnote{127 For a variety of reasons, it was necessary to divide her interview into three.}
During my engagements with HBC it became increasingly clearer to me that if I wanted to study how the Studynet became part of and took part in moving the everyday living associated with HBC, then I needed to attend to the shifting specificities of its engagements. When attending to these, it appears difficult to locate general practices with the Studynet in the everyday living. This matter is also indicated in the above quote from the interview with Sarah, and it is a challenge when introducing a knowledge sharing system like the Studynet in education. The Studynet is not just one thing that human actors can engage with. The Studynet involves many different ICTs and functionalities that are not equally relevant to each and every person at anytime. Rather, any engagement may involve partial engagements with, and combinations of, several of these.

On the ‘surface’ it may appear as if e.g. students and teachers are more or less engaging in the same ways with the Studynet. For instance, when referring to the annual satisfaction surveys conducted for employees and students in the 2004-2005 and 2005-2006 school years, it appears as if the activities involving the Studynet are quite homogeneous. Students appear to be using the Studynet to check their e-mail, homework, grades, absences, schedules, documents and messages, etc. Teachers basically appear to be using the Studynet for distributing materials, resources, messages, e-mail communication, knowledge sharing (which is a folder for exchanging common documents in the organization), publishing teaching plans, etc. The activities appear to match the functionality categories in the Studynet. When attending to the activities inside the Studynet, however, it also becomes clear that different functionalities are being used for what are apparently the same matters, e.g. assignments may be located under Messages, under Documents and under the dedicated Assignment and Assignment Delivery functionalities. Thus, inside the Studynet usage appears to be slightly less homogeneous than what becomes evident through the satisfaction surveys. The satisfaction surveys, however, may be good for providing an indication of how
many people use the Studynet and how often as well as how many people can access the Studynet from home and school, not to mention provide an overview of what the activities involving the Studynet are usually categorized as.

When attending to the activities inside the Studynet, some class sites seem to be engaged actively in everyday activities while others do not. Some classes seem to use the Document functionality, while others seem to emphasize the Message or Homework functionalities. When surfing the ‘insides’ of the Studynet a large number of uncertainties begin emerging: Is this a representation of everything that is or has been going on? While observing IT-B classes, I became aware of the fact that some teachers clean up their class sites, which means they erase old activities. As a result, what I am looking at is clearly not a representation of everything there is to say about this. Furthermore, I cannot access everything on the Studynet, for example, I do not have access to the users’ private sites with e-mail and other activities. Although I can partially see things that are gathered on class and subject sites, I do not have access to seeing how individuals engage with the Studynet. Another uncertainty is how to describe and figure out activities on the Studynet, e.g. are there many, too little or enough? The answers to these questions are not visible within the arrangements of things on the Studynet. Neither the Studynet nor the satisfaction surveys describe the complexities involved in making different things as well as assemblages of things become enrolled as actors in the heterogeneously assemblaged everyday living associated with HBC.

On the Studynet things are collated and grouped under common headings – that is functionalities e.g. Discussion, Links, Messages, etc. – and some of the websites on the Studynet consist of assemblages of different functionalities, e.g. class and subject sites appear as assemblages of particular functionalities like Discussions, Messages, Documents, Links, etc.

The satisfaction surveys and the representation of activities on the Studynet list and order things in particular ways. However, the ways in which activities are interobjectively related cannot be understood from these gatherings. The constitutive entanglements which things refer to are not visible from the Studynet. While both satisfaction surveys and the Studynet can be understood as ways to partially contain and articulate things, they also take part in altering the relationships inside which things originally appeared.

Lists, models, schematics, articles and research reports are different variations of what Latour (1986) calls inscription devices. Inscription devices do not determine, but take part in processes of mobilizing things. Research literature participates in sorting things
out as well as directing things in ways that, in relation to these visualizations, may seem as matters of fact\footnote{Facts are harder or softer as a function of what happens to them in the hands of others (Latour, 1986). To Latour all facts – knowledges – are matters of concern, but when they become objectified as facts/evidence, they have been established as more solid matters, which means things we do not necessarily find necessary to be uncertain about.} rather than matters of concern (Ellgaard Jensen, 2007a; Latour, 2005).

Inscription devices take part in what Latour (1986) calls the *domestication* and *disciplining of the mind*. Inscription devices can be viewed as instruments to keep things in place – which is difficult when only handling things with the mind. Consequently, inscription devices are central actors in domesticating and disciplining activities. To domesticate is also to make familiar, recognizable, and knowable. In science, inscription devices such as scientific articles and reports are mostly the end result of numerous processes of mobilizing things, i.e. objectifications. According to Latour (1986), inscription devices may be understood as ways of visually sort things out. In this sense, researchers produce images ‘of’ things, and each image is partial and must be viewed as partially existing in relation to and including countless relationships that, in concert, constitute things and their relationships. The challenge of inscription devices is that they are also ways to (dis-)entangle things and thus necessarily alter things. This is an unavoidable premise. An even greater challenge is perhaps that these alterations cannot be drawn from the inscription devices. This is what Latour (2005), as mentioned, calls the *principle of irreduction*. There is no way to go back to the state of things as they were.

The Studynet and the satisfaction surveys can also be viewed as variations of inscription devices. They represent gatherings of things. But how to engage with these? How to entangle them in relationships? They are ephemeral. The Studynet is an actor that is not always there, and when it appears it does not necessarily do so in the same way as in other circumstances. Furthermore, each contribution to the Studynet (e.g. a document) momentarily appears in specific entanglements (also depending on how the user navigates the system and engages with other contributions). What partially contains these as well as what is partially contained in them may continuously move. A document may occur as a deliberately provocative document describing a fictional distance teaching scenario in relation to an E-learning Group meeting at one moment and then, at another, become part of the distribution of suggestions for engagements in different instructional activities involving the Studynet. Each functionality may partially contain and become associated with several variations of activities, for example, when the *Documents* list partially contains student’s group work, assignments, different
materials of relevance for the assignments, etc. The Links list could principally contain references to every on-line website on the World Wide Web:

![Screenshot of a link to an on-line Paint Shop Pro course from a HHXI class site.](image)

![Screenshot of a link to an on-line resource about text analysis from a HG1 Danish course site.](image)

What contains e.g. a link and what the link contains, as well as the ways in which a link may become engaged in everyday living, are neither determined nor entirely visible from the location of the link ‘inside’ the Studynet. The same argument can be made in relation to the categorization of things as e.g. assignments. What contains e.g. an assignment and what the assignment contains, as well as the ways in which an assignment may become engaged in everyday living are neither determined nor entirely visible from the location of the assignment ‘inside’ the Studynet. And answers cannot be deduced based on the heading – that it is an assignment – or its momentary location and partial representation in the Studynet.
Chapter 3: (Re-)Configurations

In order to understand how the Studynet partially contains the everyday activities at HBC as well as the ways in which they partially contain the Studynet, it is necessary to look at the practices inside which the Studynet becomes partially entangled.

**Researching ephemeral things and things that do not easily open up**

This thesis is concerned with a research object – a knowledge sharing system called the Studynet – which to most people appears to be difficult to grasp and which some, I am sure, find quite boring. Fortunately, I am not alone. Researchers have even formed The Society of People Interested in Boring Things, which works with topics like how nematologists use computers to keep track of their worm specimens. In other words, topics that are “generally low profile (to put it mildly)” (Leigh Star, 2002). What the members of this society all have in common is, according to Susan Leigh Star, their interest in *infrastructures* (e.g. large-scale information infrastructures such as the World Wide Web and libraries). Leigh Star describes infrastructures as matters that are difficult to see and open up: “These behind-the-scenes, messy or boring items form a crucial part of the materiality of how scholarly and scientific work is done” (2002, p. 109).

Leigh Star describes how the design and use of information systems (i.e. infrastructures) impacts the flow of knowledge and knowledge practices. For example, when researchers want to but cannot publish their research in a journal that has not existed very long that does not appear on their department’s list of approved journals – meaning indexed journals that count on the science citation index. Infrastructures may take part in supporting and emphasizing certain activities as well as undermining them. Another example of information systems/technologies that list, categorize and sort things out is the Yellow Pages in the telephone book, where e.g. Alcoholics Anonymous at one time may be listed under “emergency services” and at another time under “rehabilitation”. Leigh Star, who came up with the journal and Yellow Pages examples, is particularly concerned with what she calls the work involved in creating and using *standards* (e.g. maps, examinations, birth certificates, citizenship forms, sizes, etc.). Leigh Star describes her work as a process of *revealing the inner workings* (2002, p. 115). She mentions two kinds of structures: Category and classification systems and infrastructural technologies (ibid., p. 116). The concept of infrastructures presented by Leigh Star is a *relational concept*. Rather than a priori thinking about infrastructures as something *other things run on*, the author explains:

> For a highway engineer, the tarmac is not infrastructure but topic of research and development. For the blind person, the graphics programming and standards for the
World Wide Web are not helpful supporters of computer use, but barriers that must be worked around (Star, 1991). One person’s infrastructure is another’s brick wall, or in some cases, one person’s brick wall is another’s object of demolition … infrastructure is a fundamentally relational concept, becoming real infrastructure in relation to organized practices.

(Leigh Star, 1991, p. 116)

Leigh Star’s concept of infrastructure is in a sense highly similar to the concept actor-networks. It is a concept used to describe complex relationships that are not easily, entirely and maybe only momentarily visible. While infrastructure may associate to structures that are generally beneath/behind other things, this is not what Leigh Star’s concept entails, and it is not what I relate to. The above quote emphasizes that things and their relationships shift. Leigh Star’s concept is presented as yet another way of describing the shifting relationships at HBC that are not easily captured in either pictures or observations. The teachers’ homepages, for example, became visible actors (to me) through ephemeral relationships (Law & Urry, 2003). The homepages are not something you stumble upon when physically walking around the school’s premises, and they were momentarily and partially ‘out of the picture’ when I engaged with different actors at HBC. When I talked to the teachers they had, in a sense, already disengaged with their homepages. I chose the phrase ‘ephemeral relationships’ because it was e.g. through the teachers’ more or less incidental (as the focus was on their present use of ICT in everyday living) mention during interviews and conversations and Peter’s PowerPoint presentation at the E-learning Day in August 2005 that I realized how central these actors were in describing the ways in which the Studynet became part of and took part in moving the everyday living associated with HBC. Orlikowski (2007) refers to Google search results as examples of fleeting phenomena: “They cannot be easily understood if we ignore Google’s emergent sociomaterial performativity or assume the search engine and its performance are given and stable … Google’s temporally emergent performance and results are multiple, shifting by time, by location, and political and institutional conditions” (ibid., p. 1445).

Researching things as relational and thus also momentarily existing matters also means engaging with things of a more fleeting nature, things that are not constantly there, things that may come and go, reappear or disappear inside relationships of different kinds. This may be another methodological key to examine relationships between ICTs and education in everyday living. The challenge with seeing ephemeral matters is that they do not relate to actors in the same way. Not all teachers engage with the Studynet in ways that involve this passage between the homepages and the Studynet. The passage is a specificity and it is – in the case of Sarah – specifically related to her fully committed approach to working with the Studynet, and more specifically, her engagements with the Assignment and Assignment Delivery functionalities.
The passages involved in moving between practices with homepages and the Studynet are specific and thus not easy to ‘detect’. Furthermore, the passages between the specificities associated with Andrew and Sarah’s teaching activities and the specificities associated with the Studynet are of a different kind. In Andrew’s case what matters is that he cannot rely on computers, the Internet or the Studynet being generally available either in school or in students’ homes. This is not the case with Sarah and Peter. As previously mentioned, the materialities of the Trollesminde Allé school in Hillerød, where Sarah, Peter, Laura and Vivian work, are much different than the materialities at the Frederikssund school where Andrew works. Thus, inside the specificities of Sarah’s teaching engagements, computers, the Internet and the Studynet are principally generally available all the time while in school. This influences Sarah and other actors’ possibilities for engaging with the Studynet in everyday living. They are able to engage the Studynet differently as an actor in everyday activities. As already mentioned, wireless Internet access is generally available at the Trollesminde Allé school, for example, in hallways and classrooms with computers available for students. At the time, video projectors were also being installed in most classrooms.

The specificities of engagements with the Studynet are currently not of general interest at HBC. Specific instances, unless clearly matters of technical failure, are down played by IT support, and they are not particularly in focus in either the E-learning Group nor the different events set in motion. The event that provided the best space for engagements in these specificities was the E-learning Day arranged in August 2005, where teachers from the E-learning Group presented their engagements with establishing relationships with ICTs in their everyday teaching activities.

Specificities are easily dismissed as getting caught up in too many details. Sarah and Peter, as will be shown, are left with an abundant amount of concrete challenges that are not articulated in the organization, partially because they are represented as specific experiences and as mere matters of moving (i.e. simply transferring) things from one technology, i.e. homepages, to another, i.e. the Studynet. The class and subject sites are also referred to in everyday living as the class and subject homepages. This furthermore
participates in making it seem as if engagements and relationships involved in teachers having their own homepages and having class and subject homepages on the Studynet does not make that much of a difference. Because the different practices and variations of enactments of what it means to engage with homepages carry the same label, they would not be visible in the satisfaction surveys either.

Sarah and Peter explain the situation differently. What appears from the interview with Sarah is also that having conversations about these matters is rather difficult. This is partially due to the fact that language does not easily encompass all the specificities and relationships involved in what we are supposedly sharing concerns about. Sarah’s descriptions illustrate the ways in which her engagements with the Assignment and Assignment Delivery functionalities as *the point of departure* for assignments changes both what it means for her and the students to engage with, handle and interact around assignments. Her experience of the differences between engagements with teacher homepages and handling assignments via the Studynet become intertwined in the interview. During the interviews with Peter and Sarah, it becomes articulated that engagements with homepages in everyday living also mean getting the engagements entangled with the everyday educational practices of providing structure, communication and engagement in a variety of activities. These entanglements change when Sarah and Peter move to a different instrument for partially handling things. Consequently, the activities also partially change.

**Second story: Enacting variations of doing assignments**

![Example of assignments in the Assignment functionality.](image)
Sarah explains that involving the Studynet in her communication and the way she structures teaching activities also means compromising her options for being creative. She explains that when she involves the Studynet, it necessitates following deadlines once they have been articulated on the Studynet.

Sarah: It changes my work day. I must think differently when I start incorporating the Studynet into my planning. This way of structuring my teaching activities, this is what I experience as limiting in relation to the creativity that otherwise exists as part of the work day when you plan your activities … It’s not like a brain that works very quickly and says this and this and this next. You do that on the basis of long term [and loosely defined considerations] … You think, then we have four weeks for this, where we’ll touch upon that. But it depends on the class. It is always a matter of things working together that may make changes necessary. Once its laid out on the Studynet, you’re forced to follow the schedule. The students also feel obligated to follow the schedule. Sometimes you have decided on a date and then you find out that it doesn’t fit that well after all. Something interesting may be going on that you want to pursue further … You cannot be flexible when the schedule is laid out. Or you can, but then you have to explain to
the students that you are making changes because you think you should spend more time on this. When it is not in writing, then it’s only in my head that these changes have to take place.\textsuperscript{129}

In HG, modularization, flexibility, achievement levels (\textit{gærdehøjder}), real competencies\textsuperscript{130} and teaching differentiation are key phrases. The school is required to place students initially according to their level and the educational program the students are expected to follow. This means that students in the same class may not follow the same educational patterns, levels or objectives:

HG students do not follow the same basic course, which can vary from 20 to 76 weeks. Sarah explains that she usually (in relation to basic subjects) starts by studying the subject syllabus, then she places students at the right level and finds materials for the subject syllabus, the topics, the required competencies at the different levels and the examination. At HBC they try to construct classes in accordance with the students’ levels, but Sarah explains that she has always tested the students herself, because — as she explains: “You do not assess in the same way”. Teaching activities are mostly a combination of classroom teaching and teaching activities organized around the different levels and competencies that fit the different educational programs the students

\textsuperscript{129} Interview with Sarah, HG teacher, conducted by Hansbøl, April 28, 2005.

\textsuperscript{130} Real competencies include those gained through both formal and non-formal education.

\textsuperscript{131} “Vocational education and training consists of a basic course and a main course. The basic course is flexible in duration and depends on the individual student’s prior qualifications and ambitions. Typical length of such a basic course is usually between 20 to 25 weeks. This is followed by the main course or VET-programme, which is based on an alternating principle. This typically takes 3 - 3½ years, but can be shorter or longer for certain programmes (from 1½ and up to 5 years)” (The Danish Ministry of Education, 2008, p.2). HG is Hillerød Business College’s fulltime on-campus basic education, which lasts approximately two 2 years. It is the first part of a four-year commercial vocational program.

Ministry of Education (2008, p.2)\textsuperscript{131}
Chapter 3: (Re-)Configurations

are expected to follow. Sarah explains that many times she will divide the class into two
groups and teach one group at a time. While she teaches the one half, the other half
typically works on their written assignments.

Sarah: It’s a mix between classroom teaching, working together in pairs, group work
and then of course also some IT in the computer rooms. It can be anything from
grammar programs to writing English letters, to finding information related to a
movie we are going to see, or solving assignments.132

Most assignments are handed in individually – even when working in groups. This is,
according to Sarah, a problem when using the Studynet, because if a group hands in an
assignment, then only one person gets the response when the teacher has corrected the
assignment.

Sarah: Another example of how we work is when they spend the first two lessons
working individually. Afterwards they work in groups and end with a presentation.
We always divide things into little pieces. They are impatient and cannot sit still for
three hours to hear about theory … So, if you have them for three consecutive
lessons, then you plan them differently. In the first lesson we do this, in the second
we do that, and in the third something else.

Mikala: Is having three lessons at a time typical?
Sarah: Yes, electives are three consecutive lessons. Then we have basic subjects;
typically it’s the same; other times we have double lessons. It’s a long time. It’s
always a balance between learning something and not taking too long.133

Sarah tells me that in order to understand her experiences with the Studynet, I must
remember that she has been engaging with the Studynet as if it is the point of departure
for things. The place from which to work. This engagement influences her experiences:

Sarah: It would be nice if some things were corrected, e.g. that more programs could
start up on the Studynet. Perhaps it’s mostly HG employees that notice this, because
we use many different programs in our teaching. We use significantly more
programs than just Word and Excel. We have long-term courses with other
programs.134

Partially existing full (dis-)engagements

Sarah emphasizes concerns about making assignments via the Studynet. She mentions
noteworthy differences, e.g. in the necessity to structure the working processes. She

132 Interview with Sarah, HG teacher, conducted by Hansbøl, April 28 2005.
133 Interview with Sarah, HG teacher, conducted by Hansbøl, April 28, 2005.
134 Interview 1 with Sarah, HG teacher, conducted by Hansbøl, May 30, 2005.
finds that the Studynet makes her and the students’ working processes more rigid and less flexible. The Studynet, as was pointed out in the math example, does not interoperate with many other technologies. Sarah and several other teachers also mention this as a central limitation to their options for engaging with the Studynet in everyday living. Assignments involving other kinds of file formats than Word and Excel cannot be associated with the Studynet. This means that for Sarah to engage with the Studynet as the channel for handling assignments she needs to disengage with several of the other ICTs that they normally engage with. Sarah’s experiences with the Studynet must be understood inside these relationships. In addition, they articulate another passage between the specificities of the ICTs that take part in the constitutive entanglements of everyday living and the specificities of the Studynet. Sarah and other teacher’s (dis-)engagements must also be understood in relation to these kinds of passages.

Sarah illustrates how the involvement of the Studynet as the actor around which doing assignments revolves may radically alter what it means engaging in doing assignments for both teachers and students. This, of course, is when Sarah chooses ‘wholeheartedly’ to engage in relating the actions involved in giving assignments to the students, the students’ handling of the assignments, and the teacher’s correction and feedback to the Studynet. Furthermore, this is when Sarah takes her point of departure in the particular dedicated Assignment module on the Studynet. Compared to Sarah’s descriptions of doing assignments without the Studynet, Sarah states that entangling assignments with the Studynet in this way involves a lot more structuring, which takes energy and effort. This energy and effort, she suggests, reduces the students’ concentration when working on assignments.

Third story: In-between practicalities

135 E.g. in the industrial academy programs, they are working with Access which is not – at this moment – compatible with the Studynet either. Also pdf. files cannot be uploaded to the Studynet at this moment.
Sarah experiences several challenging practicalities in handling assignments via the assignment functionality that makes it difficult to use. The students need to hand in assignments in the right place. Furthermore, in order to correct the assignments Sarah needs to save each assignment under a new name, which is too time-consuming. She says that students have difficulties finding their assignments.

Sarah: There are many ways for students to do it wrong. They must be very systematic in order to hand in their assignments. They have to find, attach and send the assignment. Before doing that they have to have started the right program from somewhere and also know what to do if things are not located on the Studynet already. Often it turns into a mess when I receive the wrong things or something they didn’t mean to hand in. The students have to focus on the instructions for assignments while simultaneously dealing with these technical aspects. How are they going to solve them and in what order? In light of this, much is required of the students and they must have a comprehensive view. Then, when I hand back an assignment to the students – if it’s a typical assignment – I go through it as a class. The next problem is that they each sit in front of their own screen and focus on their own individual mistakes. This is really different from a similar situation in an ordinary classroom with an overhead. You cannot capture their attention in the same way in a computer room. … So it’s not just a matter of handing in assignments.\[136\]

Sarah’s explanations illustrate that handling assignments with the Studynet is not just a matter of mastering functionalities and delivering assignments. Rather it is a matter of reconfiguring the activities and relationships involved in handling, working with and doing assignments. She describes many different details concerning how to approach assignments when correcting them that the teacher needs to learn, e.g. minor details like remembering to change the status of an assignment that has been corrected so that the student can also see it.

\[136\] Interview 1 with Sarah, HG teacher, conducted by Hansbøl, May 30, 2005.
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Sarah: I have to do the corrections individually. It would be faster for me if I could take e.g. all the PowerPoint presentations and correct them. I have to navigate to find each student’s assignment. It easily becomes time consuming and confusing.\footnote{137}

Sarah experiences the maneuverings of the assignments as becoming increasingly complicated on the Studynet when the Assignment and Assignment Delivery functionalities are involved.

Sarah: This means that compared to not using the Studynet, I have to structure my teaching activities differently when I want to use it. It requires both the students and I to have a comprehensive view. It also means that you have to work with and receive assignments in specific ways. In the end it requires a different way of learning, because it becomes a different way of approaching ICTs in teaching. …

[On an ordinary day without the Studynet] I would decide from home what we’re going to work on during the three lessons. Then I’d start by saying today we’ll work like this and this. Then I’d write something on the blackboard: what they are supposed to hand in and work on and how to approach the assignment during the three lessons. I’d probably put them in pairs for the second lesson and use the third lesson for presentations. I’d explain when we’ll start. Then they’d work. In this situation I can use the media fully because I can be flexible and the students can be dynamic in their ways of learning, because things don’t need to be done in a particular way, e.g. that there is a specific way to start things, that things must be saved in a particular spot and so on. It makes demands that we are not used to in ordinary teaching – normally. We simply have PCs, programs, and an ordinary flash drive for storing. It is as simple as it can be. It requires only basic competencies that most people have learned at home or in primary school. In this way I find it very limiting compared with the ways we normally approach and engage with things. I spend a great deal of time walking around class and making corrections on the screen. Then I make a check mark on a list I have to indicate that I have gone over that [not all assignments are ones that must be handed in].\footnote{138}

Sarah also adds that she often does corrections during class when they hand in assignments on paper. This is partially why she thinks that handling assignments \textit{via} the assignment functionality on the Studynet moves the focus away from what they are supposed to learn. Instead, all the practical aspects of dealing with an assignment fill up their time.

Sarah: I’m of course used to correcting on paper. It is simply faster. If I go around in the classroom I can elaborate. On screen I have to put more effort into explaining. They need to read and comprehend my comments. They need to understand what I mean, and they have to carry it out before they have learned anything. They engage with this better when they have a teacher to engage in dialog with who can illustrate

\footnote{137} Interview 1 with Sarah, HG teacher, conducted by Hansbøl, May 30, 2005.

\footnote{138}
and elaborate. It is easier by hand. You have to do more physical operations and you have to think in particularly structured ways [when using the Studynet]. It is more difficult. … No two days, lessons and classes are the same. There’s lots of dialog, dynamics and flexibility. That’s what makes it so interesting …

You have to think systematically on the Studynet in order to make it work. You have to slice things. I don’t think that the teaching activities are getting better. It may take part in creating a comprehensive view for the students e.g. in relation to knowing when to hand in assignments, but that’s it … You teach students to become extremely structured, and that’s a shame regarding the learning opportunities IT provides… I like the set up of the homepage much more because I’m much more in control and I have the opportunity to be flexible when communicating with students.\textsuperscript{139}

\textbf{In-between interobjectivities and (dis-)engagements}

Sarah has approached the use of the Studynet with ‘complete’ dedication to the Assignment and Assignment Delivery functionalities. While neither the Studynet structure nor the yellow pages and one platform strategies determine the activities that employ the Studynet at HBC, they do partially influence the activities. They become active ingredients in the way activities do or do not unfold at HBC. However, as the above interview replies indicate several other coexisting actors also appear. Sarah explains that they are used to having flash drives and storing assignments on them. Working with many different ICTs in their everyday living, they become part of what it means to engage with assignments. Furthermore, the central difference between Sarah’s engagements with communication and the structuration of activities via the homepage and the Assignment and Assignment Delivery functionalities on the Studynet is that the homepage does not engage with what handing in assignments contains or with what the assignments may contain. The Assignment and Assignment Delivery functionalities become a particular way of containing the assignments that partially decides what they may or may not contain. This is one more passage between specificities in everyday living. There is a partially existing passage between working with assignments that may take many forms (i.e. involve Mathcad and Access) and contain many forms within (i.e. Excel, PDF, Word, software and other programs that can be saved and accessed using a flash drive), and working with assignments that are contained by a form (i.e. the Assignment Delivery functionality) and can therefore only be comprised of \textit{certain forms} within (i.e. Word and Excel files).

Engaging with the Assignment and Assignment Delivery functionalities enrolls assignments in particular relationships that partially disengage with some of the

\textsuperscript{139} Interview 1 with Sarah, HG teacher, conducted by Hansbøl, May 30, 2005.
assignment practices Sarah refers to (currently, and inside these relationships). They are practices that she finds particularly valuable for the student groups she deals with and the teaching methods she uses. We can say that homepages, flash drives, the Studynet, Mathcad, etc. become part of the infrastructure that takes part in classifying and categorizing – sorting things – as relevant or irrelevant in the everyday living associated with HBC. This is a political matter that concerns Sarah.

Fourth story: Making technologies and pedagogy work together

IT support does not fully respond to Sarah’s experiences and they are not articulated in the E-learning Group either. Sarah expresses a need to gather experiences:

Sarah: Pedagogy, which is the teachers and the schools’ approach, interests me. That’s an angle I find worth pursuing. Just saying that we have the most recent technology does not mean that our job is done. It affects both our work day and routines. It affects our forms of teaching. I believe that we should make the most of the best teaching opportunities IT offers for the programs and platforms being developed … We should consider the extent to which we will use it. How should we use it as colleagues? How should we present it in class and how should we use it in our teaching? … We should discuss the Assignment and Assignment Delivery functionalities. How should we use them if we use them? Can we use them? Do they live up to our requirements as teachers? This is when we turn to pedagogy. But it gets drowned out a bit in the “now we have to use it” mentality. Then you just use it. There ought to be some kind of focus on coordinating, leading and developing activities. Who gathers experiences? How do we move on with organizational learning? Who provides new inspiration (other than John), and how can we develop things in more dynamic ways?  

A cold turkey approach

During the 2004-2005 school year, the approach to the Studynet has, according to Sarah, been very much a now-we-have-the-platform-all-we-need-to-do-is-start-using-it approach. This has partially been the point of departure for the initial launch of the Studynet. The launch of the Studynet is also described by John as a cold turkey approach, where the change meant giving up old habits from one day to the next. Going cold turkey can, in this sense, be used as an analogy for HBC's head-first dive into the merger between the Studynet and everyday living at HBC. In relation to Sarah and Andrew’s descriptions of their everyday living, the analogy becomes rather interesting. Going cold turkey means cutting off relationships entirely from one moment to the next. As the examples with Sarah and Andrew illustrate, this is a rather unrealistic way of depicting the complex movements that actually ‘take place’. The analogy draws on the

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140 Interview 1 with Sarah, HG teacher, conducted by Hansbøl, May 30, 2005.
imaginary that processes of association with the Studynet involve a complete dedication to the Studynet and a complete rejection of previous relationships. The analogy draws on a certain kind of association seen as feeding on processes of pure substitution. Referring to Latour's (1991) concepts of association and substitution mentioned earlier, this can be viewed as one variation of how processes of associations and substitutions may be enacted. This variation draws on an either/or logic which takes its point of departure in either things/actors that become engaged or disengaged. But as also Laurier notes: “… ‘connecting’ is not as on/off as opposing it to disconnection implies …” (2001, p. 7).

Engagements are often understood as equivalent to things/people that are working, while for disengagements, things no longer work and people are disinterested. In other words, the engagements of things and people are often imagined as working through replacements and complete dedication. The yellow pages, a one platform strategy and the cold turkey approach take their point of departure in full (dis-)engagements.

Momentarily, few resources or spaces exist in the organization for engaging with these matters, and for continuously gathering and coordinating experiences with the Studynet. Sarah expresses concerns about the need to arrange this kind of development work. John and Joelle are more or less the only resources dedicated (though only partially)\(^\text{141}\) to working with these relationships – which they call e-learning. John – at this time – calls the strategy for integration of the Studynet in everyday activities a cascades strategy. He refers to it as a hope that small initiatives will spread like rings in the water to the rest of the organization. John\(^\text{142}\) describes the cascades strategy as taking its point of departure in an imaginary of things that spread. Many events – cascades or showers – are launched in the effort to make the Studynet a substantial part of everyday living in the organization. Most of them are concerned with disseminating information (e.g. through introductory courses, workshops, manuals describing operations such as how to upload an assignment and how to upload a document as well as descriptions of general scenarios explaining how to use, for instance, the discussion functionality in teaching activities). Furthermore, as Sarah notes, the emphasis has been on sharing best practice examples, i.e. examples of good workings. None of the activities include the kinds of experiences and relationships that Sarah deals with. The challenges she faces are not a matter of technology that does not work or a matter of a technology that does work.

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\(^{141}\) John is head of quality and communication at HBC. E-learning and the Studynet are only two out of multiple other matters that John has responsibility for, e.g. the school newsletter, implementation of the HG Student Plan, editing the school homepage, teaching history classes, etc. Joelle is involved in the Studynet and e-learning only part-time. She also works on technical matters related to engagements with other ICTs in the organization.

\(^{142}\) Later, during a telephone conversation in 2008, John explains that he no longer believes in the cascades strategy.
Rather, her challenges are about establishing appropriate relationships and passages between ICTs and the pedagogical practices that take part in making the constitutive entanglements involved in Sarah’s teaching work. These are the kinds of workings that currently partially engage Sarah. The IT support focuses on non-workings that belong to the Studynet. Currently, the other activities at HBC focus primarily on spreading knowledge about imagined general workings and good workings.

During her interview, Sarah expresses concern about the development of things. She thinks that the new HG reform, new educational tools like the Student Plan (*Elevplan*)[^143], and the recent move away from project work and group exams in HG towards case exams and more teacher controlled assignments represent an increasing focusing on structuring things and slicing things into what appears to be easily handled learning objectives. Sarah problematizes the apparent lack of space established in the everyday living for discussing and evaluating the ways in which new ICTs can take part in the development. She sees a need to discuss the progression, where they are headed, and what direction they want to be headed in. ICT is not in and of itself good. She describes the focus at HBC on the Studynet as having primarily been concerned with the *amount of use* and not so much with *quality of use*. The basic assumption has been that the greater the use of e.g. the assignment facility the better. To begin with the success criteria was whether someone was using the Studynet. But as Sarah suggests: it may actually make things worse.

Inviting an actor like the Studynet into the school’s activities may contribute to radically altering the way things work together in education. Sarah raises important concerns as to whether or not e.g. assignments ought to be managed via the Studynet’s Assignment and Assignment Delivery functionalities. Perhaps the issue is not so much whether the Assignment and Assignment Delivery functionalities are inappropriate, but that in relation to HG and this particular group of students, their teacher and their everyday concerns, using these functionalities as the main frame for managing assignments may not be appropriate. Rather, the Studynet should be engaged partially based on careful consideration regarding ways in which it takes part in altering the relationships of things fruitfully. As Sarah suggests, it needs to be a matter of what the students, the teaching, and the teachers gain (and maybe loose) from using it. Thus, there is a need to attend more to the ontologically multiple, continuously emerging, partially existing (dis-) engagements with things when involving the Studynet in everyday living.

[^143]: “The Student Plan is a web based pedagogical planning tool for schools that offer VET programs. Apart from supporting the individual student’s planning, the web tool is meant to support students in gaining a comprehensive view of their progress in the VET program.” (Source: “About the Student Plan”, accessed on June 20, 2009: http://www.elevplan.dk/offentlig/default.aspx?sideid=elevplaninfo.)
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Another issue appears from the conversations with Sarah. Similar to the interview with Andrew, Sarah also suggests that the qualities of different classroom teaching practices with(out) ICTs are important to include in discussions of the relevance of ICTs in everyday living. The conversations with both Sarah and Andrew illustrate that when engaging with ICTs it is central not to lose sight of the complicated entanglements and relationships in everyday living inside which ICTs may become appropriate or not. It is also important to note that the interview with Sarah only involves aspects of the Studynet. In other words, it is not a general dismissal of the usefulness of the Studynet.

Not many teachers engaged with the Assignment and Assignment Delivery functionalities during the 2004-2005 school year and later a decision was made to invest in Microsoft’s Class Server, which John refers to as an advanced assignment module. Thus, (dis-)engagements with the assignment functionalities can be related to many issues. Many teachers, however, still manage assignments using the Studynet. They engage with different kinds of workings, which will be examined further in Chapter 6.

Fifth story: Moving from homepages to homepages on the Studynet

The relationships involved in the daily movements of things associated with ICTs are difficult to ‘see’. During informal hallway conversations, John partially expresses this on several occasions, one time stating: “We don’t understand why things are not being used. They are simply three clicks away, just waiting to be used.” The imaginary that what matters is that people should simply engage by clicking three times (e.g. to learning objects, to uploading an assignment) is of course not to be understood literally. I see it as an analogy to the complex challenges of introducing and making ICTs compatible with the everyday living associated with education. In the ongoing course of everyday living where engagements are manifold and not – like the researcher’s engagements – entirely focused on the specificities of the entanglements with ICTs, it is a difficult challenge. Especially because the knowledge available on ICT integration does not necessarily aid engagements with things the way I describe them here. Engagements with ICTs are often described by e-learning researchers as general, generally applicable and (learning) strategically applicable in the sense that what is needed are cultural turn-around projects in which schools engage – through full commitments – with certain approaches to instructional practices and disengage – through full rejection – with other practices with ICTs, neither of which provides very helpful approaches for understanding the everyday living at HBC. They are generally

not defined by one practice hindering/enabling the uptake of ICT. Also, any engagement with ICTs may, as described, be understood as partially (dis-)engaging. This will be further illustrated in the following example with Peter’s movements from homepages to homepages on the Studynet.

For the E-learning Day on August 26, 2005, the HHX teacher, Peter, made a presentation comparing his experiences of working with homepages and the Studynet. The following slides from Peter’s presentation illustrate how he played with the esthetics and homepage visualizations.

Like Sarah, Peter describes how he has used his homepage as a structuration and communication tool in relation to his teaching activities. The students can go to the homepage and find information about their assignments and links to a variety of online resources:

The previous screenshots and the one below illustrate the different appearances of Peter’s homepage and the Studynet Assignment functionality as a means for structuring and communicating about assignments:

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145 Slide from Peter’s E-learning Day presentation on August 26, 2005.
Peter explains in an interview\textsuperscript{146} that, for him, the shift from working with personal homepages to working in the Studynet involves great changes. One central change is that while he used to have a copy of his homepages on his home computer, the class and course sites on the Studynet cannot, in the same way, easily be copied in one place on his home computer. This means where things are actually located becomes less transparent for Peter. Things appearing on the Studynet do not refer to one and the same location. Furthermore, when Peter had his own homepages he was in control of the design and structure, but now he fills out preexisting spaces – templates – in the class and course sites on the Studynet. This has the effect that he is uncertain about where things go e.g. at the end of the school year. Using other words Peter expresses the concern that he is losing the sense and understanding of the spaces, timings and agentizations of his activities. In this regard, he feels much safer with a personal homepage. Peter explains that it feels like being Alice in Wonderland, right when you think you understand things, they become something different.\textsuperscript{147}

When Peter refers to the feeling of being Alice in Wonderland, he is referring to the movements between his previous engagements with homepages and his present engagements with the Studynet as well as the experience that the continuous shifting out and introduction of new instruments for teaching contributes to this feeling of constantly being in-between things where you know how they work, and things where you do not know how they work.

Although there are many differences between working with homepages and the Studynet, one central issue – for Peter – is his sense of being in control of the design and the navigation. His analogy to Alice in Wonderland describes how he experiences the engagements with the Studynet as filled with uncertainties about what contains things, how they are being contained as well as what they may partially contain. This experience is partially analogous to Sarah’s experiences with handling assignments

\textsuperscript{146} Interview with Peter, HHX teacher, conducted by Hansbøl, May 12, 2005.
\textsuperscript{147} Interview with Peter, HHX teacher, conducted by Hansbøl, May 12, 2005.
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through the Assignment and Assignment Delivery functionalities. This issue can be defined as a condition for the movement between things and the entanglements of things, i.e. the movement between entanglements of things involves enacting (un-)certainties. The nature of these (un-)certainties is not something which is easily anticipated before becoming engaged with the movements – in this case between homepages and homepages on the Studynet – because Peter’s everyday practices with ICTs (i.e. homepages) may not be articulated before but rather while engaging with this new technology (i.e. the Studynet). One example is when Peter is approaching the end of the 2004-2005 school year and he needs to make a collation of the curriculum for the exam covering what the students have studied throughout the year. At that point, he realizes that the ways things are being gathered – spread out into separate messages – on the Studynet does not make the collation process an easy task compared to using his own homepage. Thus, moving from homepages to the Studynet also means translating a variety of different ‘other’ engagements and practices entangled with Peter’s homepage. Sarah and Peter are not simply transferring content from one location to another. Moving from homepages to class sites and course sites means that the infrastructure involved in activities like doing assignments becomes altered. The fact that teachers may have engaged with just one homepage for several classes compared to the Studynet, where teachers need to engage with a class site and course site per class, is a great difference to Sarah and Peter.

In the words of Latour and Hermant (2006), the translations charge with reality. They do not simply connect old parts of reality with new and more effective technologies. Rather, the merger of things makes different realities partially available while also partially disconnecting with variations of realities. At the moment when I engage with Peter, his engagements with and knowledge about the Studynet emerge in relation to entanglements with his personal homepage practices and with present practices for locating communication about assignments and structuring teaching activities using the Studynet. In relation to these engagements, Peter’s previous engagements with his homepages become partially articulated. In other words, through these momentary entanglements what Peter used to do becomes partially (in-)visible.

Engagements with the Studynet in-between specificities

Peter has, like Sarah, engaged in trying to make the Studynet the point of departure for his activities. He has sent many e-mails to IT support asking questions and describing problems. The problems are manifold and even for an experienced IT teacher like Peter, it becomes difficult to maintain a positive attitude. Already in September and again in December 2004, Peter writes to IT support to tell them that he is getting truly tired of
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the Studynet. The students experience connectivity issues from home, due, for example, to their differing ICT equipment, programs and Internet connections. Some have to log on to the Studynet every time they want to access a new page. Some of them cannot view the activities because they are working on e.g. a Windows 98 and Office 97 platform:

![Screenshot of assignment deliveries that are not viewable](image1)

The above screenshot illustrates that when engaging with a Windows 98 or Office 97 platform, seeing assignments that have been handed in using the Assignment Delivery functionality on the Studynet might not be possible. On several occasions, the schedule on the Studynet has also been functioning poorly for longer periods at a time:

![Screenshot illustrating the same activity eight times in Peter’s schedule](image2)

148 According to both of the annual satisfaction surveys conducted by HBC in 2004 and 2005, students experience connectivity issues from home. In 2005, approximately 24% of the students, on average, at the Trollesminde Allé school write that they cannot access the Studynet from home. In Frederikssund, approximately 46%, on average, cannot access the Studynet from home. Some students explain that they do not have the facilities, an Internet connection that is too slow or non-existent, or that they do not have Internet because they have moved away from home. Numerous students, especially in Frederikssund, write that the Studynet does not work in some way or another. The figures vary greatly from class to class and between departments. In Frederikssund, there is one class where 25% of the students cannot access the Studynet from home, while in another it is 82%. At the Trollesminde Allé school, everyone in one class has access while in another 43% do not. This of course affects teachers when they engage the Studynet in their teaching activities, which several teachers comment on in 2005.

149 Screenshot of Peter’s e-mail correspondence with IT support and John, April 2005.

150 From Peter’s e-mail correspondence with IT support and John, December 2004.
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Peter also faces navigational frustrations like not being able to return to the previous view of a page without everything, or what he calls *exploded* discussions and particular views of discussions, returning to their original, or what he calls *imploded* positions. Peter finds that what he expresses as the most basic functionalities are much too complicated, for example, the following view of his websites, which appears when he needs to save a document:

![Screenshot of Peter’s websites, which appear when he saves a document](image)

Peter writes that saving a document is like *playing blindfolded* and asks: “How on earth could anyone believe that the above can enhance clarity?” (ibid.). During the interview, Peter explains that he has previously been very engaged in writing and making homepages. He made his first homepage in 1997, and at one point he had three homepages. Over the last three to four years, he has been making homepages for student assignments and the syllabus for his IT class. During the 2004-2005 school year he stopped making homepages and states: “As a loyal employee, I stopped making homepages this year when the Studynet arrived. I have regretted that ever since.”

Like Sarah, Peter is unclear as to whether anyone follows up on the different problems and challenges. Furthermore, to ‘whom’ and ‘where’ the problems belong are not transparent. Do they, for example, belong to Peter or the students’ lack of knowledge and inability to do things the right way? Or to Peter or the students’ software, hardware and Internet connections, to HBC’s installation of the Studynet, to NNIT’s assemblage of the DDU.net, or to Microsoft’s construction of the standard technologies involved in the Studynet?

During the 2004-2005 school year the teachers, John and IT support expended a significant amount of energy and resources on figuring out the answers to these questions. The biggest challenge seems to be that these challenges are the partially

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151 From Peter’s e-mail correspondence with IT support and John, December 2004
152 Interview with Peter, HHX teacher, conducted by Hansbøl, May 12, 2005
existing results of the different mergers between the Studynet, HBC and actors associated with HBC; and therefore these issues continuously emerge and could not generally have been anticipated. For the Frederikssund school, they may not experience the same challenges, or as many, because they cannot engage with the Studynet in their everyday living in the same way as the actors at the Trollesminde Allé school. This is another passage between specificities. The passage is between the specificities of engagements with the Studynet in relation to the specificities of the different materialities relating to each school and their respective actors.

Rather than considering the continuously emerging problematics as matters that should and could generally have been avoided, it may be more fruitful to think in terms of these issues as conditions that need to be continuously reengaged with and reworked. Neither the ‘platform’, the ‘train’, nor the ‘end station’ are known factors; they are better described as being intertwined, coexisting and reconfigurated partially with the ongoing movements of the constitutive entanglements of everyday living. While the yellow pages, one platform, cascades strategy, and the cold turkey approach may not represent the ways things generally move, they become part of the ways things move. They too can be viewed as taking part in making the constitutive entanglements that makeup HBC and its relationships at that point. Furthermore, they take part in making the Studynet a part of the everyday living.

The point is that even though full (dis-)engagement approaches do not rule out handling introductions and engagements with ICTs in everyday living associated with education through partial engagements approaches (this is not a possibility), they do not exactly support this either. And as the example with Sarah illustrates, they may actually become part of teacher and school efforts to make things work in unrealistic ways.

If there had been more focus on the partialities of ICT integration in the everyday living at HBC, Sarah would maybe not have put so much focus on trying to commit to a functionality (though this is a retrospective conclusion); Peter, John and the other actors would conceivably have been more alert about the variations of specificities influencing the (dis-)engagements with the Studynet; and John would perhaps not have been taken as much by surprise in relation to the different apparent ‘non-workings’ and ‘disengagements’. It would still be difficult and require a good deal of specific as well as heterogeneous work to make the Studynet compatible with the everyday living associated with HBC, but the engagements with these challenges may have been handled and thus also experienced differently.
Providing remedies or partially existing movements?

This chapter concludes with a discussion of the concept of remediation because in some literature and research about relationships between ICTs and education in Denmark, notions about remediation are used but they are mostly not discussed or elaborated. Heilesen and Bækkelund Jensen (2003), for example, write: “... nothing is gained from merely attempting to transfer existing forms of teaching to the new medium ...” (p. 2).

Even though the authors comment that the act of transferring old forms alters the practices, it still seems to be an underlying current that one can either use the new medium (e.g. knowledge sharing systems) to simply continue conventional forms like classroom teaching, or one can pursue the use of the new medium to create new forms of teaching and learning (see also Heilesen, 2001). Langager (2006) presents a similar approach: “Computers and other digital equipment have been implemented in the institutions first and foremost as efficient tools for habitual learning” (p. 189).

In the Danish literature notions of remediation mostly refer to a negative way of approaching new media in education – taking its point of departure in a kind of just-old-wine-in-new-bottles logic. And, most importantly, the old wine is usually not considered good and interesting in educational relationships. Sometimes this imaginary becomes related to the ICTs. Mathiasen (2003), for instance, refers to some technologies as a priori merely representing the electronic pencil case.

These apparently simple forms of remediation involve the more or less mere transfer of things/practices/capacities from one media to another. This is clearly not interesting for researchers with a focus on learning potentials and building the schools of the future. However, by enacting things as being either the old in the new (e.g. moving assignments as objects handed in on paper to objects handed in via computer) or doing new things with new media (e.g. arranging net-based group work at a distance), we tend to forget that when things are presented as interesting and non-interesting, the new and the old, they are not matters concerning the inherent qualities of things. In order for things to become interesting and non-interesting, new and old, a great deal of work has to be done. This work becomes ignored when we a priori categorize things on the basis of the old vs. new dichotomy. Through this imaginary we deprive things of their complicated sociomaterial entanglements.


153 This ‘quest’ for the school of tomorrow within e-learning research will be looked at again later.
Remediation refers to the idea that new media become defined in relation to old media, and old media in turn may incorporate aspects of new media in the old. Bolter and Grusin write that remediation is a matter of taking a property from one media and reusing it in another. They emphasize that this move involves both refashioning and absorption/appropriation. Furthermore, Bolter (2001) writes that remediation is both a matter of rivalry and homing because usually a new medium claims to do what other media has done, but better. Bolter and Grusin (1999) refer to different forms of remediation:

- New means of getting access to older materials – pouring content from one medium to another
- Better means of representing old media without challenging them
- De- and re-contextualising old media i.e. collage and photomontage
- Almost total absorption of old media

(ibid., p. 45-48)

The authors refer (among others) to Latour’s book, We Have Never Been Modern (1993), and claim that they argue for the acknowledgement that remediation is a condition of the living world. There is no direct access to the world, and all mediation involves remediation. Still, they refer to media as objects that may embody and absorb other media or properties from other media. While suggesting, in line with Latour, that any media must be viewed as a hybrid, their argumentation is that we move from old to new media, and also from new to old media. In Bolter and Grusin’s arguments something transfers, and it is a common feature of media that they can absorb and may become entirely or partially absorbed by other media.

In order for media to be incorporated by other media, we must start with the assumption that a medium is an autonomous object that can, more or less unaltered, transfer into another medium. A medium in this sense basically exists (in singular) without its sociomaterial entanglements with the living world. Furthermore, a medium in Bolter and Grusin’s presentation becomes a general object. A book is a book, CD-Roms are CD-Roms.

In the book, Writing Space: Computers, Hypertext, and the Remediation of Print (2001), Bolter depicts computer technologies as having inherent qualities such as flexibility, interactivity and speed of distribution (ibid., p. 3). Bolter writes that in the second edition of his book (first published in 1991), he has tried to use a different language that will not be as associated with technical determinism (an inheritance he claims to have drawn from McLuhan and Ong):
The technical and the cultural dimensions of writing are so intimately related that it is not useful to try to separate them: together they constitute writing as a technology ... technologies do not determine the course of culture or society, because they are not separate agents that can act on culture from the outside. Yet the rhetoric of technological determinism remains common today. Popular writers often seem to suggest that technologies, especially digital information technologies, are agents in this sense. The World Wide Web, virtual reality, or computers are said to revolutionize our society, our economy, and even the way we think. More substantial writers such as McLuhan and Ong can also sound like technological determinists …

( ibid., p. 19).

Bolter suggests that technologies develop, but Bolter is not referring to the ongoing everyday translations of technologies as they become produced in everyday living and entanglements. In Bolter’s imaginary, books embody texts and so do computers and the Internet – cyberspace. Furthermore, a medium may take another medium’s place, and remediation is described as a process “of cultural competition between and among technologies” (ibid., p. 23). In both Bolter’s and Bolter and Grusin’s book, media are depicted as having agencies and properties. Although preoccupied with developing the concept of remediation, they do not seem to engage in a thorough questioning of their central concept, medium. The World Wide Web absorbs and refashions (Bolter, 2001, p. 25), and it is a stand-alone system (ibid., p. 29). Another example of this is represented in Bolter’s way of describing a word processor: “A traditional word processor, which imitates the layout of the typed page, flattens the text and offers a writer little help in conceiving its evolving structure” (ibid., p. 30).

Bolter enacts media as a priori having agency. He also enacts relationships that a priori position media in negative or positive alignments with one another; he also places media on a scale where the new is mostly equivalent to something better than the old is.

The imaginary of remediation as presented by Bolter and Grusin (1999) and Bolter (2001) implies holding a particular variation of a past medium still while imagining it can become integrated in the new and vice versa. Remediation implies that there is an old media that can be incorporated in another new media. Both of which, to begin with, exist as separate (though hybrid) ‘bodies’ in time and space. Thus, the concept of remediation also entails the imaginary of technology transfer.

Latour’s concept of mediator involves a critique of the imaginary of technology transfer. To Latour technology transfer is a highly rare occasion where things are being held together and engage in almost (never exactly) the same relationships and engagements across time and space – no matter which instruments they become entangled with (he uses metrological chains as an example of this). Technologies
generally translate and become translated by things in much more complicated ways than what can be described as a *media being immersed/incorporated into another media*. Furthermore, multiple variations of technologies partially co-exist and co-evolve. We do not simply have new *replacing/substituting* the old or the old being incorporated and refashioned in the new and vice versa. The new and the old as well as the new in the old are particular ways of enacting relationships between media. As seen in the examples with Andrew, Sarah and Peter, the old does not necessarily pre-exist in the new; in these cases, the old becomes old in relation to the present enactments of things. And more importantly, many different variations of what is old and new co-exist. Furthermore, what is new may only be visible as new inside particular relationships (e.g. at HBC); in different entanglements it may be enacted as old (e.g. in Microsoft). Things are not necessarily *either* old *or* new, and what is old, may also be new.

Activities that are represented as mere matters of remediation in the sense that we are doing the same a little bit differently, only with new technologies/media, may appear to be simple, thus requiring little work. Consequently, we can ignore and categorize these workings as insignificant, basing our conclusions on the premise that these activities simply represent old, conventional, traditional and *familiar* usages transferred into new media. Some things may a priori become disinteresting (e.g. teacher homepages) in relation to a particular imaginary of innovation (e.g. knowledge sharing system) as existing in opposition to the old. When we believe that we are moving in the direction of more complexity and better quality education with new technologies, we easily overlook that what takes part in making technologies, media, etc. complex, better, effective, etc. are exactly the enactments of technologies that take part in sorting things as relevant/irrelevant, interesting/disinteresting, etc.

In this regard, *environmental remediation* becomes an interesting analogy for describing the understanding of remediation as proposed by Bolter and Grusin:

> Generally, remediation means providing a remedy, so environmental remediation deals with the removal of pollution or contaminants from environmental media such as soil, groundwater, sediment, or surface water for the general protection of human health and the environment or from a brownfield site intended for redevelopment. Remediation is generally subject to an array of regulatory requirements, and also can be based on assessments of human health and ecological risks where no legislated standards exist or where standards are advisory.¹⁵⁴

Bolter and Grusin’s remediation may serve as an instrument to enact relationships between technologies/media through their construction as separate existing media/technologies – as objects – with no ‘pollution and contamination’ from the environment. The authors’ constructions involve comparative moves that enact differences and similarities in particular ways, and essentialize, generalize and disconnect media from their everyday entanglements and relationships.

Even though Bolter (2001) tries to escape technological determinism, his argumentation throughout the text continues to link things together by a priori essentializing and opposing things such as outline processors and word processors. One thing becomes the background against which he depicts the general strengths and weaknesses of the other. However, in relation to the description of the ways in which the Studynet becomes part of and takes part in moving everyday living at HBC, this is not adequate. Bolter does not question what makes media media. He takes them for granted to begin with, and his arguments build mostly on particular fixed orientations of what technologies are, and thus how they are different and similar to each other. He does not question his own workings of these differences and similarities. Bolter does not study writing technologies as sociomaterially constituted, partially existing and momentary effects.

Marilyn Strathern (2004) questions comparative studies like that of Bolter’s. Latour (1991) argues that since the processes of translations involved in making things things may enroll entirely different actors, objects – like cameras – may carry the same name, and appear to be the same, but in practice they may become entirely different variations of a camera. Two cameras may not have many relationships in common. Strathern (2004) makes us aware of the different constructions involved in making comparisons. In order to compare, we put things in relation to each other. The very act of comparing involves such moves. But as Strathern suggests, things may not exist in these kinds of autonomous relationships and engagements with one another. Things are much more complicated and mutually inclusive (Mol, 2002).

Even though Bolter emphasizes that new media always involve both rivalry and homage, they seem to be the output of his argumentation rather than inherent qualities of media. The concept of media/medium remains a mystery throughout both Bolter’s and Bolter and Grusin’s texts. It is never quite clear what the authors mean by mediation. In many ways it seems like their concept refers to processes of remedying.

Remediation has become a concept that is sometimes referred to more or less explicitly in Danish literature about relationships between ICTs and education. However, this concept entails associations that might not be fruitful when we wish to engage in the study of how ICTs take part in and become part of moving everyday living.
Remediation already involves conclusions about the relationships between technologies as being matters of old versus new inserted by means of contrasting juxtapositionings (Ellgaard Jensen, 2007a).

In his book, Bolter uses the phrases technologies define themselves as … and the medium itself encourages …, which indicates that while claiming to acknowledge social and cultural dimensions of technologies, Bolter ends up adding agencies to the technologies in question. He uses print as a ‘backdrop’ for understanding, discussing and constructing electronic writing (both in singular), partially in contrast to print and partially as a new presentation of earlier writing technologies. Bolter establishes earlier writing technologies as carriers of particular qualities, and this creates part of the basis for his argumentation.

I find that Latour’s concept of mediators is much different from Bolter’s concept of mediation:

An intermediary, in my vocabulary, is what transports meaning or force without transformation … an intermediary can be taken not only as a black box, but also as a black box counting for one, even if it is internally made of many parts. Mediators, on the other hand, cannot be counted as just one; they might count for one, for nothing, for several, or for infinity. Their input is never a good predictor of their output; their specificity has to be taken into account every time … Mediators transform, translate, distort, and modify the meaning or the elements they are supposed to carry. No matter how complicated an intermediary is, it may, for all practical purposes, count for just one – or even for nothing at all because it can be easily forgotten. No matter how apparently simple a mediator may look, it may become complex; it may lead in multiple directions which will modify all the contradictory accounts attributed to its role. A properly functioning computer could be taken as a good case of a complicated intermediary while a banal conversation may become a terribly complex chain of mediators where passions, opinions, and attitudes bifurcate at every turn. But if it breaks down, a computer may turn into a horrendously complex mediator while a highly sophisticated panel during an academic conference may become a perfectly predictable and uneventful intermediary in rubber stamping a decision made elsewhere … it is this constant uncertainty over the intimate nature of entities – are they behaving as intermediaries or as mediators? – that is the source of all the other uncertainties we have decided to follow … The real difference between the two schools of thought becomes visible when the ‘means’ or ‘tools’ used in ‘construction’ are treated as mediators and not as mere intermediaries.

(Latour, 2005, p. 39)

As a way to sum up and conclude this chapter and on the way to engaging in the next, I find that looking at Latour’s concept of mediators is appropriate. Bolter and Grusin deliver a theory about remediation that takes its point of departure in the ways new
media refer to old media. Latour’s concept of mediators is not a theory about what mediation *is* and how it happens, but rather a suggestion for engaging in *concretely and specifically* understanding processes of mobilizing things. What partially contains new and old, what new and old partially contain is not naturally given in the order of things. Bolter and Grusin’s theory may be understood as a suggestion for how we should *generally* understand the ways in which media become actors in the living world. They present it in opposition to the imaginary that new technologies cause revolutions. Latour’s concept of mediator\(^{155}\) entails a focus on the interobjectivities, partial coexistences and ongoing translations of things. In order to engage with these aspects, we need different ways of studying the multiple concrete ways in which relationships between ICTs and education become continuously reconfigured through movements in the constitutive entanglements. In other words, we need to move away from *a priori* imaginaries such as: when engaging in the use of ICTs what most commonly happens is either *total transformation/immersion* – cultural revolution; *simple remediation* – mostly the same *again* or just a little bit better; or *the old and the new mixing*, as if we already know what old *stuff* the new needs to engage with. And as if we already know what is new and what is old.

Bolter and Grusin’s concept of remediation may be misleading (if taken as a general point of departure for explaining things). Through interviews with Sarah, Peter, and Laura as well as conversations with the head of HG, Vivian, this chapter illustrates that the Studynet is not just another way of continuing the same way, e.g. handling assignments by just other means, and it is not just another better, easier and more effective way of working either. What is new and what is old continuously move and coexist partially inside the specificities of the merger of the Studynet and everyday ways of handling things (e.g. assignments) at HBC. This merger involves multiple partial passages between things. Throughout this chapter, I have described variations of passages that enroll many different actors and relationships between things. These passages cannot be described as matters of either *the old in the new, the new in the old* or something entirely new. Bolter and Grusin’s descriptions may be viewed as particular enactments of relationships between media. These descriptions, however, do not generally apply to the emerging and complex movements and relationships involved at HBC.

Bolter and Grusin’s analyses work from a theory of remediation as a general matter. Their theory becomes problematic when engaging with a relational and complex concept of *movements in everyday living* that does not assume to begin with the relationships of things and their space-timings (i.e. what is old and what is new). This

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\(^{155}\) I understand Latour’s suggestion as an invitation to understand any actor as mediator (something which needs understanding) rather than intermediary (something already understood).
may be another methodological key to researching ICTs as actors and movements with ICTs in everyday living.

**Potential criticisms**

At this point, readers may object and think that what I have illustrated with examples from Andrew, Sarah and Peter’s activities is exactly what Bolter and Grusin argue: That it is a matter of pouring the old (existing practices) into the new (the Studynet) or vice versa. In the case of Andrew, Sarah and Peter, the Studynet becomes part of their already existing everyday ways of handling things. They are not trying to do something new with the Studynet in the sense, for example, that they intentionally invent new forms of teaching, education and learning. This is, as I will illustrate in later chapters, a particular way of carrying on the conversation about development in schools with ICTs: it is either a matter of doing more or less the same ‘boring stuff’ or it is a matter of ‘cultural revolutions’ truly engaging new and better (not boring) practices in education. My argument is – and I believe that the examples with Sarah, Andrew and Peter partially illustrate this – that this either/or is a particular variation of what it means to engage educational programs in movements with ICTs. But it cannot be used as a general approach for describing what happens at HBC. At HBC, many different actors partially coexist and become continuously reconfigured during the ongoing processes of (dis-)assemblaging everyday living. Actors, i.e. mediators, are always constitutive entanglements that dissemble and disassemble, and they come in many different forms. Thus, nothing pours like water, more or less unaltered from one general place (container) to another (generally better container). Both what contains as well as what is contained continuously partially moves and become ontologically, multiply (re-)configured.

This raises a central problematic: If neither the ‘platform’, the ‘train’, nor the ‘end station’ are generally known, then how can we engage in handling the complex, ontologically multiple and heterogeneously assembled perpetual movements engaging everyday living with ICTs in education?

Slightly rephrased: If we generally do not know and cannot anticipate what the passages between things are – that is what is the new and what is the old – and they themselves are specificities and emerging effects, then how can we handle movements in the living world?
This chapter explores further how the Studynet becomes part of and takes part in moving the everyday living at Hillerød Business College. Beginning with the introductory seminar arranged by HBCs e-learning coordinator, Joelle, and a conversation between John, Joelle and me, this chapter illustrates how the Studynet is partially mobilized as a very different actor in multiple coexisting realities relating to HBC. While Chapter 2 illustrates the enactment of particular unidirectional strategies for engaging with the Studynet, Chapter 1 illustrates a situation inside which the Studynet became partially disconnected, and Chapter 3 illustrates situations inside which the Studynet was enacted as a partially (dis-)connecting change agent through full (dis-)engagement approaches. Chapter 4 illustrates how engagements with the Studynet in heterogeneously assembled everyday living involve several emerging partially existing and engaging practices and strategies. This chapter illustrates that both Hillerød Business College and the Studynet are being partially and multidirectionally (re)formed in relation to the ongoing emerging engagements with the Studynet.

In relation to these analyses, the conclusion derived from this chapter proposes that rather than thinking in terms of integration (assembling parts in a whole)/implementation (execution)/diffusion (spreading) of the Studynet as a process with a well-defined beginning and end consisting of consecutive (and teleological) phases/steps of introduction, getting used to and gradually establishing and stabilizing (certain planned for) educational practices with the Studynet to move on from (i.e. as the one platform and yellow pages strategies suggest) at HBC, the movements involved in engagements with the Studynet are better described as perpetually mobile, ontologically multiple and coexisting processes of mobilizing (in-)compatibilities – partial (dis-)connections and constitutive entanglements – workings – in relationships between the Studynet and the heterogeneous everyday living relating to HBC. This description involves acknowledging that both the Studynet and HBC exist in processes of translations that involve continuous makeovers of the ontologically multiple make-ups and, thus, partially existing identities of each one and both of them – as they become collectively gathered. To see and understand these complex movements, however, one needs to engage in multiple ways of moving the contexts of knowledges and engagements involving the Studynet.
Thus, as we saw in-between Chapters 1, 2 and 3, Chapter 4 further illustrates the suggestion that moving the contexts of knowledges and engagements may be a methodological key to understanding the ways in which ICTs take part in and become part of moving the everyday living relating to education.

Representations

This chapter begins by rewinding a bit and revisiting the beginning of the 2004-2005 school year, which is when the Studynet was being partially introduced to the everyday living associated with HBC. I write partially because, since the spring of 2004, the Studynet has been partially working as part of the so-called IT environment at HBC, and partially because – as this chapter will illustrate – this is not a matter of one introduction and then moving on from there. Many introductions coexist and continue to move what engagements with the Studynet are about. As Bruun Jensen writes:

... one is quickly struck by proliferation and multiplicity when investigating the electronic patient record. By proliferation I refer to the feeling that since no common idea as to what the phenomenon consists of is available, many different places could be visited, many different people could be talked to in order to try to catch it (Jensen 2005). By multiplicity I point to an experience, following from this procedure, which suggests that electronic patient records are a heterogeneous lot according to the actors who work with them, talk about them, and care for them. It becomes uncertain whether one is studying one phenomenon, a group of interrelated ones or, by misclassification, has grouped together for studying several different phenomena.

(2004a, p.191)

The previous chapters have already illustrated how the Studynet becomes a different matter, matters differently, and engages differently with matters in a variety of circumstances. While these chapters illustrate the Studynet as a partially (dis-)engaging/engaged phenomenon, they also illustrate that certain imaginaries about ways to understand and engage with the Studynet may partially engage actors’ engagements with the Studynet. This chapter continues this conversation while also introducing some of the emerging practices that become part of the ways in which engagements with the Studynet are enacted. This chapter illustrates some of the partial ways in which the Studynet takes part in forming HBC and partially becomes formed by HBC.

First story: Studynet information

On September 7, 2004, I observed one of the introductory seminars to the Studynet held by Hillerød Business College’s e-learning coordinator, Joelle. The following
descriptions are from my notes. The introductory seminar was arranged for students and lasted one hour.

When Joelle presents the Studynet, she structures the presentation around the Studynet’s functionalities. The Studynet is presented as a place where students and teachers can find things, e.g. school related news, class pages and class related information, schedules, homework, access e-mails and hand in assignments. The introduction is set up by Joelle as a step-by-step introduction to the prearranged sites and structures on the Studynet and includes the Front page, which has school related news, the personal page, called My site, and class sites and subject sites. She logs on to the system and enters the Front page.¹⁵⁶

After briefly telling the students that this is where they will access general school related information Joelle navigates to My Site:

¹⁵⁶ The screenshots are taken from the Studynet on December 5, 2004 when I logged on with a teacher log on. Joelle had also borrowed a teacher’s password and used it as a point of entrance.
She explains briefly that this is their personal page, where they have access to e-mail, their calendar and class and subject sites. Joelle assists students in activating *My Calendar* and *My Inbox* manually because, at the time, they were not activated automatically on all of the students’ personal sites. Next, the e-learning coordinator tells and shows the students that they can go to the different class and subject sites:
Joelle mentions that the students will receive assignments here and that there is a discussion forum. Then she illustrates how to upload an assignment using the Assignment functionality. She also shows them that each user has a profile where a picture can be uploaded.

This introduction to the Studynet is a particular presentation of the Studynet that makes certain aspects of the Studynet present while absenting others (e.g. that all students, teachers and the administration have the option of establishing their own sites on the Studynet for a variety of purposes; and that when engaging in discussions with the Discussion functionality on the Studynet, it is possible to choose between variations of ways to view the discussions, etc.). The introduction is a particularly detailed event marked by the fact that it specifically illustrates and informs the student that the Studynet is a prearranged place where they can and will receive information, assignments, etc. but the different kinds of information, assignments and options for individually and collaboratively handling and engaging with the Studynet are not gone into in detail.

Apart from this brief and overall introduction to the Studynet, Joelle also arranges Studynet workshops for the teachers. Sarah attended Joelle’s winter 2004/2005 workshops, but as she and several other teachers comment: “It looks easy and pleasant to use when you go through it during a workshop, but it is something ENTIRELY different when you’re standing with students as a teacher and you can’t seem to make things work”.

157 Different workshops: “My Website and The Front Page”, “Class and Course Sites”, “Discussion Forum and Evaluation”, and “Assignments”.
158 Interview 2 with Sarah, HG teacher, conducted by Hansbøl, 30 May, 2005.
When comparing Sarah’s descriptions of her experiences with engagements with the assignment module and Joelle’s introduction to the Studynet and its functionalities, there are clearly huge differences. Joelle’s introduction to the Studynet is in line with the presentations of the Studynet discussed in Chapter 2. She takes her point of departure in the functionalities of the Studynet as they are represented in a particular description of the Studynet. What the introduction does not provide is an entrance to engage with the different relationships in the everyday living at HBC that the Studynet and its functionalities must be made compatible with.

Functionalist explanations and determinisms

Joelle’s explanations are what Mol (2002) calls functionalist explanations. Mol explains: “This is functionalism: The sick role is described as a role that consists of four elements, which are all explained in terms of the function they have for the social system … Functionalism forgets about ‘antagonism, struggle, and change,” (2002, p. 8).

STS researchers (e.g. Latour, 1993, 2005; Mol, 2002; Olesen & Markussen, 2006) make the claim that we have a tendency to individuate things. Properties, however, are never to be viewed as immanent to a thing – they argue – instead they are to be viewed as transcendent (e.g. Olesen & Markussen, 2006, pp. 171-72). As Strathern (2004) emphasized about the act of differentiation, organization and collation of materials, Olesen and Markussen (ibid., p. 173) argue that the very act of classification involves movements that enact things as well as their relationships.

According to Mol’s definition things are imagined in functionalist explanations to possess certain roles and qualities, and these roles are in turn imagined to be the functions of things in themselves. In the article Technological Determinism Is Dead: Long Live Technological Determinism, STS researcher Sally Wyatt (2008) discusses how different variations (i.e. justificatory, descriptive, methodological, and normative) of technological determinisms seem to continue to evolve. The labeling of different time periods in civilization (Stone Age, Iron Age, Digital Age, etc.) represents an example of this. According to Wyatt, the tendency to associate millennia with single artifacts is not an extraordinary phenomenon: “Historically, technological determinism means that each generation produces a few inventors whose inventions appear to be both the determinants and stepping stones of human development” (ibid., p. 169).

159 Lave refers to the core of cognitive psychology as functionalist in the sense that the mind is imagined to be “self-perpetuating, closed, input/output systems”. She also refers to structural-functionalism in anthropology as theories that conceive of societies as “coherent and consistent wholes … composed of parts whose relations may be used to explain each other” (1988, p. 191).
Chapter 4: Making ‘it’ work and reworking ‘it’

The imaginary of technological development as equal to progress is, among others, what STS researchers have engaged with in studying processes of mobilizing innovations and understanding innovations as effects. Wyatt formulates it as a matter of turning success into the result of technologies becoming working artifacts (ibid., p. 170). This is different from engaging with functions – things that already work – as the point of departure.

In Wyatt’s (2008) sense, functionalist explanations can be understood as variations of technological determinisms that we are too rarely aware of, because we generally wish to disengage with technological determinisms: “Within the humanities and social sciences we frequently ignore the equivalent of a thundering herd of elephants when we dismiss the role of technological determinism in shaping the view on actions of actors” (ibid., p. 171).

The focus on ICTs as being functions – things that already work (or not) – may also be viewed as partially guiding herds of thundering elephants contributing to the enactment of ICTs in everyday living. They contribute to understanding ICTs as matters of the introduction of enabling objects (Strathern, 1996) and change agents, and they contribute to engaging understandings of relationships between ICTs and education. Wyatt mentions four variations of technological determinisms: justificatory – the kind of technological determinism involved in (pre-)judging and justifying changes; descriptive – the kind of technological determinism associated with explanations that claim that events belong to any one actor;\(^{160}\) methodological – the kind of technological determinism appearing when methods of engagement and understandings become more or less procedural and standardized; and normative – the kind of technological determinism that appears from acknowledging things as autonomous facts rather than particular spatiotemporal fabrications of matters of concern. As Wyatt also suggests, variations of technological determinisms are to be considered a condition of the living world to be studied rather than something that researchers and others should avoid engaging with at all costs.

Functionalist explanations may also be viewed as coexisting with variations of technological determinisms, and any research that engages in understanding the functionings ‘of’ things (which I also claim to be doing) may in fact, at least in the end, become partially engaged with technological determinisms as well. Although ANT researchers replace causes with effects, this approach does not remove the fact that any research takes part in fabrications of facts through partially existing representations of workings. Thus, what differentiates researchers is not whether or not they engage with

\(^{160}\)As Wyatt also notes, these explanations may in fact be correct.
variations of technology determinisms and functionalisms, but rather the extent to which we acknowledge this and engage with ways to not use technological determinisms and functionalisms as our starting point. Both technological determinisms and functionalisms may be viewed as part of the constitutive entanglements of research and other practices, part of which cannot be controlled in the sense that we cannot foresee what research and ‘other’ practices become translated into in the hands of ‘others’.  

The four variations of technological determinisms can each be partially associated with HBC: to begin with, the Studynet is introduced as the new place for things (justificatory). The new engagements are described as belonging to the Studynet (descriptive). Introductions about handling the Studynet take their point of departure in general ways to handle functionalities (methodological). The Studynet is presented as an object to be generally used (normative).

Sarah – as shown in Chapter 3 – problematizes the difference between making things work and presenting the Studynet as something that already works. This difference was also discussed in relation to both Chapters 1 and 2, and it seems to be a recurring issue that relates to the ways engagements with the Studynet are being (un-)folded at HBC. Callon (2006) calls any working a result of the processes of mobilizing things, i.e. workings are the momentary result of making things that function – functionings. This necessarily involves, as Chapter 1 also touched upon, moving between things that appear as intermediaries and mediators. Whenever presenting the identity ‘of’ things, they may momentarily take the form of intermediaries, and when reworking the identity ‘of’ things they may momentarily take form of mediators. These processes of translations and associations (Latour, 1999a) happen through partially ‘putting things into forms’ and ‘partially taking things out of forms’. Bringing things into existence may be viewed as the double move of partially containing and being partially contained (Strathern, 2004). Another way to paraphrase this is to suggest that as it is impossible to relate to something without adding to its form in one way or another – framing it as something – then needing to continuously move between something that is and becomes something can be viewed as a basic condition. As already discussed in Vignette 2, becoming something also involves moving both in and away.

At the time of the introduction of the Studynet in the beginning of the 2004-2005 school year, quite a number of things are not yet finished or working. For instance, the subject sites are not available to all the students yet, which generally makes doing the

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161 As Wyatt suggests, we should also be aware of the ways in which science and technology studies scholars take part in enacting technology determinisms. In studying them, we also contribute to new variations of them.
introduction a very difficult task. Also, Joelle and the other actors are in the midst of getting acquainted with the Studynet. They are in the midst of enrolling the Studynet in relationships with the everyday living associated with HBC and vice versa. The e-learning coordinator is introducing the Studynet and learning about the Studynet as well as other circumstances at HBC that are related to its engagements with the Studynet, which she is perpetually and ephemerally becoming aware of. For instance, during her presentation a teacher tells her that the local network server is still up and running, which is something the e-learning coordinator had no knowledge about.  

The engagements of the human actors with the Studynet continuously face different challenges and uncertainties, which then become partially articulated in variations of settings. Some challenges and uncertainties are articulated and made partially visible in conversations about the introduction held by Joelle, some in relation to other conversations (e.g. between Joelle, John and I) and some during instructional activities.

In the following, I engage in illustrations of how different settings provide different circumstances for the Studynet to be represented as well as variations of contexts of knowledges and engagements with the Studynet. Each setting provides different circumstances for engaging in and making partially visible how the Studynet works in relationships with the everyday living associated with HBC. Before examining this, however, I briefly engage in a description of some of the specificities ‘of’ the Studynet.

**The Studynet multiple**

Like the electronic patient record described by Bruun Jensen (2004a), the Studynet is not one clearly delineated technology that is shared. This is not made particularly explicit in Joelle’s introduction to the Studynet. Each of the students, teachers, leaders, etc. engages with different realities and realizations of the Studynet. People quite concretely enter a different variation of the Studynet related to their rights (e.g. as a student, teacher and leader) depending on who they are defined as in relation to the Studynet and HBC. The Studynet’s functionalities are a priori defined as not equally relevant to each user group. Thus, already built into the Studynet are functionalities that are partially made to function in relation to the particular set-ups and arrangements of the relationships in which they become engaged (Moser & Law, 1999). John and Joelle are administrators. Peter is a teacher,  

163 I am also a teacher when I log on to the Studynet.  

162 Describing this is relevant because the argument used at the time was that access to the local server was no longer available, hence forcing people to access the Studynet to save documents at HBC.
contribute and erase contributions), *contributor rights* (which means they can contribute but not erase and rearrange contributions), or *reader rights* (which means they can only view contributions). These rights represent variations of ways to grant access to participation in activities relating to websites on the Studynet. Another option is not having access (e.g. students do not have access to teachers’ team sites).

Even though each user may be granted rights to different websites, people within the same category and group (i.e. teachers and students) do not necessarily have access to the same variation of the Studynet. They may not be members of the same websites, and also the Studynet involves specific access for each user group associated with the department (e.g. Trollesminde Allé in Hillerød and Frederikssund), education (e.g. HG and HHX), classes and subjects to which a person may be affiliated. Furthermore, people have individual ways of becoming involved in activities, navigating, handling and engaging with the Studynet which means they also take part in making the Studynet a different actor.

Rather than talking about the Studynet’s functionalities, we may be talking about the ways in which variations ‘of’ the Studynet are *made to function*. The functionings (Callon, 2006) ‘of’ the Studynet are several, not all invoked at once, but possibly extensively enrolled and coexisting in relation to various known as well as unknown spatiotemporally heterogeneous partial connections and circumstances. Many human actors can log on and engage with the Studynet at the same time without having anything to do with each other (e.g. a teacher in Frederikssund may log on to check an e-mail about the new upper secondary school reform, while a student in Hillerød may log on to write an e-mail to a teacher or another student asking about homework in history class).

NNIT has designed a preassembled structure (represented in Joelle’s introduction to the Studynet) to partially guide the human actors’ engagements with the Studynet and their ways of connecting with it. The Studynet is presented as *a place with one entrance* from which to find the activities that are relevant to each user. Relevance is defined in relation to the predefined roles of students, teachers and administrators. Students need to access general information about the school (their department), their schedule, e-mail, grades, homework and assignments; they need to access class and subject relevant information and they need to be able to handle documents and assignments. The teachers need to access general information about the school (their department), their schedule, their classes and teaching subjects; they need to be able to access shared documents in the organization and communicate with the other teachers in their teams, with the department leader, etc. Based on definitions of the generalized roles of users
accessing the Studynet, teachers, students and leaders are to begin with\textsuperscript{164} offered different points of entrance for engagements with the Studynet. Therefore, to begin with, the Studynet and what it is and may become in relation to the everyday living of each human actor engaging with the Studynet is also partially (in-)visible.

When described like this, it may appear as if these functions are made available to the different actors. But the specificities of these functions as well as student and teacher roles are not – as shown in Chapters 1 and 3 – to be found within the Studynet. The specificities of the Studynet, however, take part (as e.g. Joelle’s introduction illustrates) in the ways in which the Studynet is presented and engaged in the everyday living at HBC. Or to put it differently: Joelle as the e-learning coordinator is partially outside the constitutive relationships that make up, for example, Sarah’s teaching activities. The description of the Studynet involved in Joelle’s presentation does not take into consideration the particular relationships associated with being different actors in the everyday living at HBC.

When Joelle and John introduce the Studynet, they relate to the presentations given by Microsoft and NNIT, and to the preassembled structures of the Studynet. Particular relationships like the different rights and action options granted to Studynet users are not a presence in either Joelle or John’s presentations. What it means to be handling things is partially laid out in the preassembled structures of the Studynet. The preassembled structures take part in enacting certain \textit{presences} (i.e. when logging in, the first site is expected to be the Front page with school related news, and from there it is presented as natural to go to one’s personal space, which is enacted as the natural point of departure for engaging in class and subject related sites) as well as \textit{absences} (i.e. every user has access to making group sites or personal sites but it is not clearly articulated as an option in the pages users are guided to first). Finally, it partially enacts \textit{spaces for collating and associating things} (i.e. general information on the news page, class information on class sites, subject related information on subject sites), which each human actor engaging with the Studynet may partially engage with. These structures suggest what relevant activities are available for the different users to engage with, as well as ways (i.e. the order of things) to engage with them. As mentioned in Chapter 3, the Studynet may be viewed as an inscription device that takes part (but does not determine) in domesticating and disciplining the minds of the human actors at HBC. Presences and absences, however, move with different engagements with the Studynet. Presences and absences also appear inside the setup and arrangements of things. What may be presented in the introduction to the Studynet can easily become things no one or only few people will ever notice and/or engage with (e.g. when students log on and

\textsuperscript{164} E.g. students can be an administrators on their own sites; leaders that do not teach do not have access to class and subject sites.
continue to their My Site before even noticing the school news; or when a person chooses to log on to the Studynet using a different URL than the Front page URL. While variations of preassembled structures are partially present (i.e. the Front page, My site, class sites and subject sites, user roles and rights) on the Studynet, they are only partially existing structures to engage with. Furthermore, the preassembled structures become continuously reassembled and reengaged in multiple processes of translations through the activities and actors with which they become entangled. What appears as presences to some human actors, e.g. NNIT employees, Microsoft employees, John and Joelle, may not appear as presences to students, teachers and leaders. And even though they may appear as presences, this does not ensure what the actions different actors engage with will be. Furthermore, the contexts of knowledges and engagements and presences/absences continuously move.

Each human actor accessing the Studynet becomes engaged with a particular momentary variation of the Studynet. The Studynet participates in making its identities present, Microsoft and NNIT take part in making its identities present, and John, Joelle and the other human actors associated with HBC take part in enacting the identities of the Studynet. Each human and non-human actor partially engages with the Studynet and makes their ‘own’ partially existing variations as well. And as variations of the Studynet coexists in multiple space-timings, there is no way to fully engage with all of these variations of ‘it’. The Studynet participates both as one and as many partially existing variations of the one. Each variation partially contains many variations within and is also a variation of many (Strathern, 2004). As a presence, the Studynet – through movements with entanglements – becomes differently and multiply represented. This is another reason why we cannot assume that a particular variation of the Studynet – one presentation/description – represents the presence of the Studynet in everyday living.

The next section engages with a conversation that unfolds in a progress meeting between Joelle, John and I. It illustrates that we each represent partial knowledges about and engagements with the Studynet and its manifold connections with everyday living at HBC. No one really knows how the Studynet is affecting everyday living at HBC. We are all learners participating in processes of mobilizing the Studynet as an actor in everyday living, and we are all in processes of becoming differently partially knowledgeable and engaged. Through our engagements we become differently aware of multiple (un-)certainties related to the Studynet. We represent different situations and each situation becomes part of another situation in-between, and thus the movements of

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165 This is one of the functionalities ‘of’ the Studynet: in principle, anyone can assemble his or her own favorite sites – and thus also enact his/her own ways of navigating to things. They can collate them in the form of URLs by adding them to their Favorites in e.g. Internet Explorer or by having collections of links on the Studynet.
presences in each situation also relate to the in-betweennesses of things. Moser and Law, as mentioned, argue that “movements between specificities is also a specificity in its own right” (1999, p. 201). The timings and spacings of engagements are not to be found inside the immediate\textsuperscript{166} situations, but rather situations emerge and move with the enactments of partial entanglements of things in-between. Situations move and emerge with moving contexts of knowledges and engagements and collations of them.

Strathern’s point (2005) is, as already touched upon, that moving the contexts of knowledges and engagements partially moves both the already existing contexts of knowledges and engagements as well as the matters of concern. In other words, places move. This is different from imagining that moving contexts of knowledges and engagements is a matter of going from one place to another place (which suggests that places already exist). Another way of expressing this is what I in Chapter 2 call the moving platformations. It is – as I see it – a rather crucial point. If we imagine that the Studynet is an already existing object that can be moved into and across different contexts of activity, our concern will most likely be with the ways in which this object becomes engaged with the different (cultural) contexts. This may lead us to conclusions such as some objects and cultural contexts are better matches than others. This will be a partial result of the ways in which we imagine the engagements of things. If we imagine moving grounds and objects as part of the same move, then it becomes interesting to investigate the grounds that bring objects into existence and vice versa. Imagining objects (as bodies/platforms that work) that enter places (as bodies/platforms that work) is one way to establish the grounds (and their specificities) in relation to which objects come into existence.

The ways in which we imagine things to be matters in-between matter to the ways agencies become understood and enacted. Agencies are made partially public through movements between representations.

The meeting with Joelle and John illustrates that the everyday movements and entanglements related to the Studynet can be understood empirically as emerging effects.

\textsuperscript{166} I use ‘immediate’ in the simple sense that things that are presented in this time and place are what make the situation. Latour (2005) has made the point that no interaction is ever local (immediate) interaction. According to Latour (2005, pp. 200-201), there is no such thing as interactions that are isotopic – things always relate to other places, materials and actors, synchronic – many different times always meet and fold, synoptic – not all actors are visible, homogeneous – actors and their relationships are heterogeneous, or isobaric – no predictability in power relations. This is another way of saying that interactions are never local and never immediate. But it is also a way of saying that times and spaces are not simply matters of successive time – which is just one way of understanding time as revolutionary, sequential and chronological (Latour, 2005a) – and geographical/bounded/regional locations – which is one way of understanding space as a matter of a series of simultaneities.
entangled with *multiple processes of mobilizing* (including the researcher’s and this meeting’s) *everyday living* at HBC.

**Shifting relationships and engagements with the Studynet**

On September 23, 2004 I engaged in a *progress meeting* with the e-learning coordinator, Joelle, and head of quality and communication, John, right before the second E-learning Group meeting. This meeting became the first of several meetings set up by me to get a current status of the engagements with the Studynet and the initiation of events relating to the Studynet in everyday living at HBC. Prior to the meeting, I participated in the E-learning Group’s first meeting and followed two IT-B lessons in HHX with IT-B teacher, Peter.

Peter invited me to join his classes to observe how he integrated the Studynet in his teaching activities. He made information about assignments available on the subject site. The students were told to access the assignments and hand in assignments via the Studynet. In one of my visits in the IT-B classes, I became aware of a group of adolescent boys who established their own group site in the Studynet. One of the boys\(^ {167} \) told me that they made the site because they wanted to share assignments but did not want the other students to access their assignments.

Part of the purpose of the meeting with John and Joelle is to generate a current overview of the activities at HBC with the Studynet. I am interested in the progress of activities relating to the Studynet at HBC, and John and Joelle are interested in knowing the progress of my research activities. The example with the group of boys becomes a part of the conversation between John, Joelle and me about when it makes sense to use the class and subject sites, as well as choosing to make one’s own sites. As three different human actors with different engagements with the Studynet and HBC’s other human and non-human actors, we approach, engage and present things differently.

**Second story: Shifting sites**

John finds the example with the group of boys interesting because it relates to an issue that he considers to be an *emerging problem*, which, among others, has surfaced in the E-learning Group. John refers to one of the members of the group who has asked him about the agenda for the second meeting in the E-learning Group and John replies: “take a look at our E-learning Group site”. John explains: “It’s not a routine yet for us to have to move around and keep updated about the various sites”.

\(^{167} \) I did not get the opportunity to interview any of these boys.
Chapter 4: Making ’it’ work and reworking ‘it’

John has asked me to make a presentation about E-learning at the second meeting in the E-learning Group. I came up with the idea that I would set up a ‘virtual’ group-based discussion – I will refer to it as the Virtual Discussion – on the E-learning Group’s site on the Studynet. My idea was that this could serve as a kick-off on the discussions about e-learning in the E-learning Group. Peter, in relation to the Virtual Discussion, brings up the issue of visiting, keeping updated about activities and crisscrossing more than five different class sites and several other sites not related to the Studynet and HBC.

Peter explains:

… we have a continuously increasing amount of virtual spaces we need to be active in – also at home where we need to log on every time we enter a new space [in the Studynet]. Here are just some of my own:

The E-learning Group
Five class sites each with a course sitethat I need to enter. At least ten possible discussions.
The ordinary school e-mail
My personal e-mail
Com-C as I participate in EPIT (two spaces)
Two subject related team spaces

It is simply too many spaces for a busy work day!

Being a teacher today, Peter notes, involves and requires being a member and active participant of many different knowledge sharing systems like – but not the same as – the Studynet.

With partial reference to these examples, John concludes that this means that one has to go many places, e.g. before going one place, like participating in a meeting, and therefore the overall message should be “Of course you can build your own sites, but in order to limit this overflow, people should try to limit themselves to the shared sites ...”.

Joelle comments that they should inform students and teachers about rules of conduct for class and subject sites as well as all other shared and formal sites. They can, according to Joelle, do what they want – within reason – on their own sites.

Specific instances and general conclusions

Several issues become apparent in the above statements. One is that this conversation can be viewed as part of already ongoing conversations and activities that take part in

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Chapter 4: Making 'it' work and reworking 'it'

mobilizing the Studynet as an actor in everyday living. Thus, it is a conversation that partially refers and adds to these processes. The way it does this also becomes partially visible through the conversation. Different associations are gathered and become grounds to move from. John draws general conclusions from gathering associations that may in fact be the result of very different relationships. Joelle also thinks in terms of general approaches to handling things, and both John and Joelle are very focused on trying to unidirect, control and limit engagements with the Studynet. This, of course, must be understood partially in relationship to their roles in the organization, as they are supposed to orchestrate solutions for the entire organization.

Third story: Opening up and closing down

Joelle moves the discussion in a different direction:

Joelle: Are we able to see all sites?
John: No, not the ones that we haven’t made.
Joelle: At some point, there will be hundreds of these sites
John: Yeah.
Joelle: And we have to be able to remove them one way or another.
John: We are talking with NNIT. Many issues still exist that need to be dealt with.
But when the students graduate, their sites should close down automatically.

Even though the Studynet is being partially presented as a particular platform for engagements in certain activities, many uncertainties and negotiations about what the Studynet is and should be about coexist with these representations. It does not have a stable identity but many coexisting articulations and enactments of it. Parts of these are related to NNIT. Introducing the Studynet as an actor in education is not a simple task. It participates in multiple and heterogeneous ways, and it takes part in making heterogeneous realities visible. Since my relationship with HBC is formulated as a collaboration and partnership, I participate in these dialogs understanding the present(s) as well as negotiating the future(s) of the Studynet and, hence, also HBC. I suggest that since HBC is now partially associated with and folded into the Studynet, it must also be important to consider the Studynet as part of the educational resources available. Seen in this way, automatically erasing students’ Studynet identities and any related activities and resources may not be such a simple issue after all.

Joelle mentions that they have had the same issue in relation to their F drive. The students knew that everything (meaning their documents) would be erased. It seemed, according to Joelle, unproblematic. We talk about that with the Studynet, educational resources may come in many forms and combinations of forms (not just documents)
that you cannot easily print and put in a folder on a shelf. Maybe it is necessary to find ways to partially archive these representations of the everyday living at HBC?

When engaging in the conversation, we are engaging partially, making sense of the matters of concern in relation to our different entanglements with things. We are not presenting different views on one and the same reality, but enacting multiple coexisting realities (Mol, 2002). HBC is in the process of becoming differently multi-sited, multi-sided, and multi-mediated in ways that makes it a very different education from what it used to be. But these movements belong to neither the Studynet nor one educational culture represented at HBC. The movements are distributed and collective accomplishments. Engaging with the Studynet involves concretely altering the grounds by which HBC and the Studynet can be understood. Bringing in the Studynet also means engaging with changes in the everyday living relating to HBC that no one can predict. Part of the reason for this is to be found in the fact that anything becoming entangled with the Studynet partially moves, and when that happens, the Studynet also partially moves. This means that the grounds are shifting, but not necessarily everywhere, anytime for anyone in the organization. It is in-between moving entanglements and their specificities that movements become visible, because the entanglements take part in presenting things (making things present).

John: We are already facing the problem that we need to create the classes all over again in January.
Joelle: Why?
John: EASY said so.

In the near future, they will face the challenge of handling more than one existing version of a class site and its related resources. John asks how to handle that? It brings uncertainties for the teachers. Do they need to start all over again? What about continuity? And the dialog shows that another actor – the administrative system EASY – is the one partially pulling the strings in this case. In other words, many variations of the Studynet coexist, and the activities partially presented in the Studynet may also coexist in multiple variations. What seems to be present all the time, yet not made explicit in the conversation, is the ongoing reworking variations of ‘what HBC will be’ in relation to different ontologies of ‘what HBC is and used to be’. Neither of these space-timings of HBC, however, exist prior to the introductions of the Studynet at HBC; they are made and remade as matters in relationship to the movements of HBC and the Studynet. Furthermore, introducing the Studynet at HBC also involves other actors (e.g. NNIT, EASY) having a say in the future possibilities of developing education in certain directions at HBC.
Shifting realities, ambiguities and appropriate engagements

Joelle, as an e-learning coordinator and administrator, is concerned about the control of activities and keeping the Studynet optimized. Therefore, it seems natural to engage in ‘cleaning’ as a mode of ordering. The Studynet is a new technology affecting the everyday organizations in education. The challenge is to create its strengths, become aware of them, as well as avoid possible weaknesses as they move along. However, the different realities of the human actors might enact what seem like strengths and weaknesses – relevant ways of working – in ambiguous ways. The increasing amount of archived activities become weaknesses in Joelle’s approach. Being a Studynet administrator quite concretely means that the Studynet is being increasingly filled with noise, leftovers, and remains, that in relation to an administrator’s reality, need to be cleaned up to avoid overloading the system. Efforts to limit engagements with the Studynet are also represented in the limitations of each user’s storage capacities on the Studynet. However, cleaning up in the sense of deleting things and limiting how much each user can store and engage with the Studynet are moves that coexist with saving and making possible education resources available for students.

Several forms of overload and strategies to reduce overload emerge from this conversation: Peter experiences personal overload in relation to having to go many places. Joelle is concerned with system overload and wishes to limit possible user movements around the system by introducing rules of conduct (what to do and where to do it); and John is concerned with minimizing things to a few common places to perhaps avoid both personal and system overload. Also, as already discussed in Chapter 2, the one platform and yellow pages strategies emphasize that only going one place is sufficient. The conversation becomes a passage between otherwise non-related instances of engagements with the Studynet. The relationships between student and teacher engagements with the Studynet are partially coexisting but also very different. The students do not engage with the same amounts of school related sites as e.g. Peter and Sarah. The students are primarily (at the moment) engaged with a class and related subject sites. Furthermore, the boys I met in Peter’s class were not interested in sharing their assignments and other activities with the whole class. Even if they were, they would probably find out (if they had not already) that their options (contributor rights) at the class and subject sites are quite restricted compared to the options (administrator rights) available on a personal site. Therefore, it would most likely not have made sense to these boys to stick to the class or a subject site. The fact that the boys had the option of creating a shared private site with a space for, for instance, sharing assignments via the Studynet, is what opened up the opportunity for them to do so. Peter’s experience of personal overload is not connected to the boys creating a site on the Studynet for
sharing assignments as it does not involve Peter. The boys’ site may become a potential threat to system overload, but it is not currently an issue.

When I described the boys’ group, I was concerned about the emerging engagements with the Studynet that are difficult to see and grasp. Compared to Joelle’s introduction to the Studynet, the boys’ group was interesting because they seemed to start engaging with the Studynet in ways that formal activities in the organization did not support at the time. During my visits to HBC, these were the only students I came into contact with who engaged with the Studynet in this way. I know that other students, especially in the further education department at HBC, were also engaging in establishing group sites for collaboration, e.g. in relation to projects. For my research, emerging engagements are interesting, and in relation to John and Joelle’s everyday living, these issues illustrate the fluidities of the boundaries of things that are difficult to administrate and engage with. These fluidities open up new possibilities as well as challenges for the actors at HBC.

Rights and engagement work

The conversation moves (initiated by me) to another topic, the rights students and teachers have on the Studynet. My aim is to understand who is permitted to do what, when, where and why? I initiate this topic as it came up as an issue in the IT-B lessons I have observed. The students’ options for action on the class sites are limited, e.g. the students cannot erase their own Discussion contributions on the class sites. When students write a message they regret and would like to erase, not having the right to engage in this activity is quite disturbing. Furthermore, contributions to the Discussion on class and subject sites are visible to everyone in the class. As a result, students may experience communication via the Discussion functionality on class and subject sites as a particular form of communication that is not relevant for them, while teachers may experience it differently as they have administrator rights. In IT-B it became apparent that the rights assigned to the different actors on the Studynet are unclear to the teachers and students (and to me, the researcher). Teachers and students do not know what they can or cannot rightfully do on the Studynet. The conversation between John, Joelle and me furthermore illustrates that rights are not just a matter of what they can or cannot do with functionalities. Rights also relate to the rules of conduct (e.g. when to erase things or not), which John and Joelle can determine, implement and encourage in the organization as administrators.

There exist no formal agreements on how the Studynet should be used. Joelle, who arranged the introduction for students and teachers to the Studynet, explains that she has said that no social talk should take place on class and subject sites. This seemed natural
to her. When engaging with this conversation, it becomes evident that John thinks that it is important that the class and subject sites become the center from which activities are dispersed. The differences in these approaches, however, have not been clear to either of them before this conversation took place. The examples from this conversation as well as chapters 1-3 suggests that the engagement work – the processes of mobilizing the Studynet as an actor in the everyday living – exists as ongoing activities. Engagement work happens through distributed and collective – though not necessarily transitive and coherent – efforts.

The conversation also illustrates that issues like access, rights, and rules of conduct emerge also out of this engagement work, and it is not always the case that what is enacted is what is intended in a given moment. John explains, for example, that every teacher, in principle, has access to everything, which means every class and subject site, on the Studynet. This is what has been communicated to the teachers. However, as it turns out, in practice John needs to grant each person access manually to every site, which means an incalculable amount of work. Therefore, he has not granted every teacher access in practice. Principally, everyone has the possibility of asking for access, though. This, John explains, is another issue NNIT must deal with.

**Emerging**

No one can truly know the Studynet before it is put to use. One can have ideas about and strategies for its principal use, but the realities may (un-)fold things differently. Rights, access, and rules of conduct are partially defined by the Studynet, John and Joelle, and any other partial connections in which the Studynet becomes engaged. The platform meets its challenges through engagement work, and this is where it becomes translated into a technology fit – or not – for the variations of everyday living relating to education and its heterogeneous actors.

In September 2004, the Studynet is an active participant and transformative delegate in the everyday living at HBC in multiple ways. However, a look at the class sites and subject sites shows that, in general, they are not overflowing with activities. As a result, the conversations about whether class site Discussions should be the point of departure of things – or not – are partially happening with reference to the entanglements articulated at the moment and partially addressed as general imaginaries about possible futures and future challenges. These imaginaries become part of what guides the further development of things, and as researchers we also take part in making articulations and visibilities.
Third story: Discussions and usability

Discussing the technical challenges John and Joelle experience directs our conversation towards the StudyNet’s so-called “Discussion” functionality. With reference to the quite limited experiences with the Discussion functionality (meaning the Virtual Discussion initiated by me in the E-learning Group, and what John has experimented with a bit concerning academic discussions in his history class), John and Joelle find the threaded Discussion functionality confusing, difficult to navigate and unclear. Joelle’s frame of reference is other (to her more familiar) knowledge sharing systems’ threaded discussion functionalities. At this point, we soon find ourselves discussing and comparing representations of discussion functionalities in relation to different knowledge sharing systems. Even though Joelle and I are familiar with knowledge sharing systems like First Class and Virtual U, we have not necessarily had experience with the same versions and installations of the platforms; Joelle has been engaged with Virtual U as a student and I have been doing it as a teacher. In other words, we have been differently engaged with variations of enactments of these systems. This makes it difficult to actually share experiences and compare activities.

John explains that when engaging with the discussions in the E-learning Group, he has chosen the flat way of viewing, because it enables him to see new comments. Unfortunately, he adds, this view also prevents him from viewing comments as related to threads in the discussions. He needs to shift between views. Joelle explains that she is not aware of all of the different options for viewing the discussions. In principal, it is possible for each user to create many personal entrances to SharePoint sites and functionalities. Below are four examples of the different options available for viewing discussions:

1. Sorted by author / Flat view
2. Sorted by date / Viewed as calendar

Being a teacher responsible for executing teaching activities and ensuring that students participate as required may involve the need to see who contributed when, with what and how much. Being able to see the number of contributions people have made and who made them not necessarily as relevant for a student, whose primary concern may be to follow and contribute to the discussions.

Each user can rearrange their way of viewing and composing individual and shared sites. This also means, quite possibly, that users apparently engaging with the same sites may not see the same things, as they have personal access points and ways of navigating and engaging with things.
This discussion leads to another topic about who/what creates usability? John explains that they are having a meeting in Denmark with NNIT and American Microsoft SharePoint specialists. HBC has participated in formulating functional specifications. John thinks that there are too many (problematic) issues relating to the SharePoint functionalities, and he argues that Microsoft must be responsible for the usability of the functionalities related to Microsoft’s technologies. We discuss what it means to develop standardized technologies like SharePoint that are not particularly aimed at education as a target group. John asks whether people at Microsoft use SharePoint for discussions and whether or not they experience the same limitations as ‘they’ do at HBC? I find it difficult to answer this question in a general way, because working in education and working in a company are generally not the same. I also find it difficult because what it means to discuss and enroll SharePoint/the Studynet in discussions is not one unified thing. It is a difficult issue because what partially contains discussions and what discussions may partially contain continuously move (this will be further elaborated in Chapter 6). John’s question is related to the question of what/when something is made usable. Usability relates to enacting something that works. What does it mean when something works? What is a standard? What makes something a standard? What does it mean? According to Microsoft, they develop standardized technologies but not solutions. Companies like NNIT develop so-called solutions based on standardized technologies and integration with locally developed technologies, e.g. administrative technologies like EASY. John engages in the discussion by partially taking his point of departure in the imaginary that standardized technologies provide functionalities that ought to be generally usable for everyone, everywhere, at anytime. As a result, IT companies must be the ones who are responsible when something does not function. It is, however, when enacted in relation to particular activities, engagements and understandings that a particular way of viewing and engaging with discussions turns out to be (in-)adequate. So what is there to do about that? Although perhaps standards in some technical sense, functionalities are not generally usable for everyone, everywhere, at any time. They do provide some kind of reality that partially contains educational practices in certain ways, but, they are also partially contained by the educational practices in which they become engaged, and there is no simple causal relation between
the Studynet and the practices that unfold at HBC – whether they are represented as appropriate or not. Neither the Studynet nor the practices at HBC determine the enactments of everyday living with the Studynet. The Studynet, HBC and their relationships partially co-exist and co-evolve.

Usability: Making ‘it’ work and reworking ‘it’

Microsoft Denmark is a sales and marketing division of Microsoft. On several occasions, John and Jason from IT support express their concern that there is a long way from the people who actually design and develop the technologies to those who use them. This distance is further emphasized by differences in concepts of time. When HBC engages with their new knowledge sharing system, the software providers are most likely already in the midst of developing the next version and new technologies related to the standard Microsoft technologies involved in the Studynet. This means that what is ‘new’ and ‘old’ must be understood as relative to its location. John and Jason expect Microsoft to be interested in knowing and finding out how their technologies are (not) working in practice. And, in principle, they are. They are, of course, always on the outlook to make improvements and develop better technologies. In practice, however, comments on an ‘old’ technology might not prove useful when enacted inside a company reality that has already moved on. Microsoft and HBC are not dealing with the same technology but several variations, and they do not share realities. So this relationship enacts a dilemma. Where can education find assistance to evaluate their investments in new technologies as well as their engagements with them? How can education find out if it is making/has made the right choices and is engaging in the right ways?

In relation to the discussions about the Discussion functionalities, user rights, rules of conduct, and usability, something noteworthy happens. It seems that the conversation continuously moves from specific instances to general discussions. In addition, ambiguities rather quickly become matters of either things that work or things that do not work. This has the partial effect that the discussions move away from the specificities of partially existing (non-)workings and (non-)usabilities. If it is a condition that because ICTs are fitted to and made compatible with the everyday living relating to education then functionings are not matters of functionalities that, in general, either work or do not work. Rather functionings appear through partial connections between the Studynet and the everyday living associated with HBC. Also, the expectations within education move in relation to the human actors’ engagements with many different ICTs. Thus, when schools work with ICTs they also partially make them work – or not work. As a result, responsibility for (non-)workings are quite difficult to
place. They are (mostly) distributed and collective effects of partially existing engagements.

The big question seems to be when is it okay to simply state that a technology or functionality is actually not working, and claim that a school should not engage with it? And when is it okay to define it as the responsibility of an IT provider?

I ask about the status of the Studynet. John and Joelle report that there are too many technical problems: Log-on problems, some teachers cannot upload to the collective folder called knowledge sharing, and some users are not able to upload documents to the Studynet at all. These problems create a sense of insecurity and take part in demotivating teachers and students – explains John and Joelle. As the conversation unfolds, it becomes clear that John and Joelle are not familiar with the same problems and the same problems unfold differently in the cases they have experienced. Each of them provides suggested explanations and each of them is partially knowledgeable about the problems and their solutions. Thus, the conversation becomes a means for coordinating experiences. A recurring topic in this conversation is that when it comes to the Studynet, nothing is really clear and transparent. It is difficult to locate problems, and in the process of locating problems, quite a few explanations emerge. Problems may appear as simple matters, but at a closer look, they often turn out to be complicated matters. Joelle and John both agree, however, that NNIT is the solution provider. The problems experienced are basically a matter of a technology not working.

These different experiences bring interesting concerns to the fore: how can we tell whether ICTs are engaged appropriately? What does it mean to engage ICTs? How can we evaluate ICT engagements? Is it not okay that several teachers choose not to use the Studynet because e.g. they use other ICTs (e.g. Mathcad) that do not mingle easily – if at all – with the Studynet? What is non-use? Is it a matter of lacking competencies? Lacking engagement? As illustrated in the examples from Andrew’s math teaching and Sarah’s work with assignments, rather than thinking in terms of either/or – either the Studynet connects/works or it does not – the many variations of partial (dis-)connections and (dis-)engagements, multiple shades of workings and their relevance that exist should be considered. The same can be claimed about use and usabilities. There exist many variations of use and usability. Chapter 1 demonstrated that having the Studynet take part in the everyday living in math in the way it does is perhaps satisfactory, because inside these momentary specificities of math teaching, this is the way it makes sense. Thus, even though the Studynet may not be experienced as a particularly relevant actor in math, it does not make it a (generally) bad or irrelevant technology. The same can be said about the Discussion functionality. Even though the Discussion functionality does not appear to work well with some of the everyday living
at HBC, it does not necessarily mean that the Studynet or the Discussion functionality are generally inappropriate for HBC. It may very well be that the imaginaries of what should be appropriate foundations of discussions in education that John, Joelle and I (at the moment) take as our point of departure, are in fact not the appropriate foundations for discussions at HBC/with the Studynet. I will return to this in Chapter 6.

Coexisting functionalist and deterministic explanations

The move between specific instances and general discussions about the Studynet is another example of what I previously in this chapter have called functionalist and technological deterministic explanations. By taking my point of departure in a few specific cases, explanations become enacted partially in relation to these particular enactments; they are made to function in relation to these grounds. However, when generalizing explanations by moving from a few incidents to making broad conclusions about e.g. rules of conduct, then the explanations may become deterministic in the sense that general actions are taken in relation to the explanations and on the grounds of particular relationships. As the conversation between John, Joelle and me demonstrates, if the Studynet is primarily enacted as a composite technology constituted by standard technologies offering certain functionalities that either work or do not work (as technical matters), then there is a great risk that the everyday entanglements, movements and specificities get lost and become absented in the everyday living with the Studynet. At the same time, acknowledging that the specificities of entanglements and challenges involved in them – as was illustrated with Sarah and Peter’s engagements with the Studynet – may involve many variations of partially existing relationships that are not just generalizable also requires accepting that it is unrealistic to try to control and administer movements with the Studynet in everyday living from one center. It calls for engagements that take partially existing translations and partial connections – not stating their general nature – as a point of departure for things. This may be another methodological key to understanding the ways in which a knowledge sharing system like the Studynet becomes part of and takes part in moving everyday living.

Microsoft’s Learning Gateway vision is presented as a framework – a working frame – and the focus on the Studynet in the everyday practices at HBC become in the above discussions focused on the Studynet as a solution – something that already works/ought to work. The human actors at HBC are in the midst of engagements with figuring out how things can work together, what it means to work with the Studynet, as well as what it means that the Studynet works? Neither the Discussion functionalities nor the Assignment and Assignment Delivery functionalities necessarily have to be what
generally contain assignments and discussions. Many other functionalities and combinations of things exist.

In Chapter 6, I will present some of the activities that are enacted at HBC that are not overly concerned with making particular functionalities work ‘as promised’: When it says it is a Discussion functionality it must be generally able to handle one’s discussions. Instead, these activities are marked by partially engaging the Studynet in ways that makes sense in relation to variations of everyday living. Instead of focusing too much on general labels, functions, and full engagements, these activities approach the Studynet as a possible *partial association*, and this takes part in enacting different spaces for activities to unfold.

The Studynet becomes engaged with the ongoing processes of transformations in the everyday living in which it becomes partially entangled. Many publications on e-learning – which I will return to later – treat ICT in singular and generalized ways that hide complicated relationships inside which ICTs and variations of everyday living related to education co-exist and co-emerge. Folding education into singular matters concerning either things that stand still or develop, and folding ICTs into singular matters with certain qualities to be actualized, hide the fluidities, ephemeralities and ambiguities of things. By not acknowledging the continuous movements of both ICTs and educational circumstances, we deprive education of important relationships involved in its development. The risk is that we ignore important changes and relationships. In other words, we may deprive education of its challenging complexities of everyday living with ICTs, and we may also ignore the massive efforts and accomplishments involved in making the technologies *technologies* that *work with* (rather than *in*) education.

In everyday life we might talk about learning management systems, content management systems, virtual learning environments, knowledge management systems, instant messaging, asynchronous text-based communication, etc. But all these ways of labeling and continuing the dialog on ICT integration in education also fold multiplicities and heterogeneities into singularities (Mol, 2002) that hide important variations of complicated entanglements. One effect is that fundamentally different variations of technologies, ‘educational’ circumstances and relationships may be categorized under the same headings, like using ICTs for handling assignments and distributing information as well as handling materials, presentations, classroom activities, group activities, activities in pairs, individual activities, project work, communication and collaboration. Another effect is that in relation to the imaginary of the – today generally (in Denmark) taken for granted – paradigm shift in education from instructivism to constructivism (I also elaborate on this later), some activities, for this
reason, appear to ‘naturally lend themselves’ more easily to imaginaries of what it means to engage creatively in innovative ways of using ICTs. These kinds of imaginaries and enactments are what I believe lead to general conclusions like the following from Ramboll Management:

“Results from E-learning Nordic 2006 show that ICT generally has a positive impact on the teaching and learning situation. However, some people expected that ICT could in some ways revolutionize the teaching and learning processes at school, and compared with this view, the impact must be seen as more limited”


There are several problems with this statement. First, the assertion is made that it makes sense to talk about ICT (in the singular) as generally having a positive impact on the teaching and learning situation (whatever that is – also in the singular). Second, it suggests that ICT does not revolutionize teaching and learning processes. It is unclear what is meant by the term revolutionize, but as this thesis illustrates, the Studynet does not have a general impact. It does however take part in bringing about many changes – just not single-handedly.

A common way to navigate the landscape of ‘educational’ ICTs is by grouping ICTs together, i.e. as knowledge management systems (KMS), and compare functionalities by, e.g. making a list of the functionalities provided by each KMS on the market. These lists can easily be used to indicate which system comprises the desired features. And systems that have the same functionalities (e.g. a Discussion functionality) may appear to be basically the same. Functionalities that are the same, however, like the so-called asynchronous text based communication used in computer conferences, may be partially contained in quite heterogeneous ways (e.g. offering different ways to maneuver discussions and distinct views of threaded discussions, as well as enacting fundamentally different possibilities for associating, for example, threaded discussions with variations of ‘other’ resources like video recordings and images). Thus, the circumstances inside which functionalities are made usable may be quite heterogeneous.

So, on the one hand, the Studynet represents particular ways of assembling things. On the other hand, one cannot grasp the Studynet as a well-defined entity with clear cut boundaries, functionalities and regularities that generally work as ‘they’ claim to or do not. The Studynet and HBC are constantly in a state of becoming because their entanglements keep changing. Furthermore, the Studynet is continuously being enacted in relation to heterogeneous physical locations that also take part in the enactments of the Studynet. The Studynet is only one (actually the assemblage of many, but appearing as one) of many ICTs and other actors that participate in the everyday living at HBC.
The Studynet forms part of the educational landscape at HBC. It forms and becomes formed by a whole range of heterogeneous actors. But, the most important issue to understand is that the Studynet is partially connected with, partially existing at and partially situated at HBC.

The conversation with Joelle and John shows that being knowledgeable about the Studynet requires a significant amount of engagement work during the process of mobilizing the Studynet as an actor in everyday living. This work includes enacting problems and their solutions. The non-transparencies of problems can become an obstacle that influences the ways in which students, teachers and leaders engage with the Studynet. If they do not experience it as reliable and usable they may not use it, and they might recommend others not to use it as well. Enactments can strengthen as well as weaken ICT reliability and the level of usability experienced. Challenges might be concrete but relationships may be enacted and generalized that do not generally relate to the challenges experienced. Furthermore, it is important to be alert about non-use and non-workings as they always exist in concrete circumstances inside which use and what works may appear problematic or irrelevant. This is a different way of engaging in understanding non-use and malfunctioning than merely stating that it is a matter of barriers like personal malfunctioning (in e.g. teachers’ beliefs, a lack in interest, motivation, ICT competencies, and engagements) or technical malfunctioning (in e.g. a functionality that does not work). Non-use and non-working are presented here as particular partially existing variations of engagements.

Practical comparisons of alternatives and reparabilities

Joelle states that she does not think that the Studynet is being used very much at her location on Carlsbergvej (Hillerød), where the business academy education is based. Not being well prepared, she believes that they have started too early. She wishes that they were better at figuring out how to use the threaded discussions. Joelle is doing a master’s degree in a net-supported program in which threaded discussions are the point of departure for most on-line activities. John, however, expresses no worries about – what he terms – the curve of development. He is concerned with the technical challenges, not all of which are technical failures. To John, it is also a matter of dealing with a much more complex technology than what they have been used to; this requires training and discipline and it is also a matter of getting to know the functionalities. John emphasizes that integrating the Studynet into the everyday practices of teachers and students with small steps is quite alright. Starting out by distributing teaching materials, homework and other instructional materials as well as information about the activities is satisfactory. It is fine with John that the point of entrance for using the Studynet might be as practical as experiencing that it saves time to not have to stand at the printer all
day. It is true though, he adds, that **e-learning activities have to be shared and spread** otherwise no one will engage in them.

The issue of spreading and sharing e-learning activities is a central topic in e-learning research as well as everyday living at HBC. How do activities spread and become shared? This question deals with the classic issues of *learning/technology transfer*. How do things become *transported* from one place to another? Do things *travel* from destination to destination? What is the thing that needs transportation, what is transportation, and what are the destinations from where and to where things are supposedly transferring?

Joelle explains that when she introduced the teachers to the Studynet, the class and subject sites had not yet been effectuated on the Studynet. This brings to the fore that the space-timings of things (whether making introductions or researching introductions) during processes of mobilization matter. The concrete circumstances and entanglements enacted in relation to these processes of mobilizations matter. The knowledges, engagements, timings and spacings ‘of’ things all take part in enacting things’ agencies. This is why, as de Laet and Mol (2000) also note, no single actor is really responsible for the successes or failures of things. Furthermore, since entanglements and circumstances matter, it is less likely that things will stay the same during processes of movement. But they will be moving in relation to the entanglements enacted that they are supposedly moving to and from. Thus, movements exist in-between things which they are in one way or another enacted as.

Returning to Latour’s (1999) gun example, one of his points about the coexistence of man + gun is that depending on how you look at things, what may be enacted is either: a mangu (social determinism), a gunman (technological determinism) or man+gun (hybrid) with no certain agency. Enactments must be understood in relationship with the circumstances. Latour makes a similar point but a bit differently, pointing out that interest comes from *inter-esse*, which means *essence in-between*.

De Laet and Mol (2000) note that what makes an actor can be viewed in relation to what happens when it stops acting. Another methodological point is that what makes an actor can also be viewed in relation to what happens when it starts acting. As the examples from HBC illustrate, engagement work with the Studynet in everyday living at HBC involves many variations of things that both partially stop and start acting. HBC is changing through the engagements with, for example, the Studynet, and this implies that becoming an actor, in some aspects of everyday living, means that not becoming an actor in others may become problematic. Furthermore, when being an actor, not working can also be understood as an act of working. Any description is a variation and
Chapter 4: Making ‘it’ work and reworking ‘it’

not everything the Studynet is and involves is visually available (de Laet and Mol, 2000), e.g. user rights are not explicated anywhere and made available to the students and teachers.

For the Studynet to act, it needs to collaborate with other actors relevant to HBC (e.g. Internet access, computers, EASY, students, teachers, leaders, administrators, teaching methods, and subjects, etc.). The Studynet does not work without the collectives that it will serve (de Laet & Mol, pp. 234-235). In line with de Laet and Mol’s argument about the Zimbabwean bush pump, the Studynet not only serves HBC by providing means for archiving, representing, handling, coordinating, and distributing materials and activities, it also takes part in building education and developing infrastructures for handling education.

Rather than taking it for granted that ICTs like the Studynet gain their strengths through general and standardizable applications, the strength of technologies like the Zimbabwean bush pump and the Studynet may not lie in the fact that they can be generally distributed and attached to many places, but that they are able to move through translations and become compatible with multiple heterogeneous and varied contexts of knowledges and (dis-)engagements.

De Laet and Mol (2000) have a point about *reparability*. Reparability, like fluidity, is part of the environments within. Gaining reparability – the authors argue – is an important aspect of making technologies partially fluid. Reparability is when the Zimbabwean bush pump appears to be not working, and it turns out that non-workings can be repaired in many ways. In relation to the Studynet, the engagement work involved in making the Studynet compatible with the everyday living associated with HBC involves shifting between things that partially work and partially do not work. For instance, when Andrew decides to have a backup plan so that they can always access and leaf through their assignments on paper, this can be viewed as a sort of reparability, a way of handling things that take part in making engagements with the Studynet work. Another form of reparability is when they replace items and add new ICTs to the Studynet (e.g. Live Communication Server, which makes Messenger and new forms of communication associated with the Studynet available). Also – as the next chapters will illustrate – when students and teachers find ways to engage with the Studynet that appear to be a better fit with the everyday living (in comparison with e.g. Sarah’s use of the Assignment and Assignment Delivery functionalities in HG), then this too can be viewed as variations of reparabilities. A form of reparability can also be that even though the engagements with the Studynet partially engage disengagements with other arrangements and actors in the everyday living associated with HBC, the engagements with the Studynet take part in moving everyday living in ways that makes the loss of
‘other’ engagements bearable, forgettable and/or absent. One example of this is when engagements with the Studynet appear to be natural (e.g. when students start the morning by logging on to the Studynet to check their schedules, messages, possible class cancelations, etc.). Many forms of reparabilities exist and take part in the continuous efforts to make things work. Entangled with these efforts are also movements of what constitutes things.

At this point, the first four chapters work together to illustrate a central point. The examples in Chapter 1 illustrate how making the Studynet work in relationships with everyday living is a matter of partially (dis-)connecting it. Chapter 3 illustrates that not working can be a matter of trying to make inappropriate installations inside momentary specificities. Combined, chapters 1-4 illustrate that making the Studynet work also involves enacting the Studynet, its agencies and possible relationships with everyday living. Thus, the central point is that one reason why we cannot simply expect education to move with the speed of light from one engagement to another is that replacing technologies involves tearing apart constitutive entanglements and reestablishing new ones. The greater the extent of the success of previous technologies to become thoroughly entangled with things also means there are greater difficulties in moving platformations.

The Studynet is just one of many (possible) actors in the constitutive entanglements of what makes education at HBC. An important question must therefore be how ICTs like the Studynet become meaningful in practice? De Laet and Mol’s (2000) answer is that this happens through the practical comparison of alternatives, e.g. between homepages and the Studynet, between assignments without the Studynet and Assignments via the Assignment and Assignment Delivery functionalities. Moser and Law (1999) also argue that while it may not be an entirely good and satisfactory improvement to get a wheelchair, it is a considerable improvement when the closest alternative is not to have one. With this acknowledgement, it follows that we may also need to attend more closely to the enactments of alternatives when we wish to engage in understanding the ways in which ICTs like the Studynet become part of and take part in moving the everyday living associated with education. A central point in relation to this is that enactments of alternatives also move with things. Thus, the grounds against which things become evaluated do not stay the same. Associations are fluid (de Laet & Mol, 2000, p. 243); what may work and seem appropriate at any given moment may not appear this way in another. The success of the Studynet depends partially on the continuous remanufacturing of:

- Its boundaries
- Evaluations of its agencies
- Its essentials
Explanations for what functions and what partially determines the functionings continuously move and emerge as well. The conclusion to this chapter proposes another way of opening up the issue of understanding the ways in which a knowledge sharing system becomes part of and takes part in moving the everyday living associated with the basic vocational and commercial upper secondary programs at a Danish business college. This chapter suggests that rather than thinking in terms of integration (assembling parts in a whole)/implementation (execution)/diffusion (spreading) of the Studynet as a process with a well defined beginning and end – consisting of consecutive (and teleological) phases/steps of introduction, getting used to and gradually establishing and stabilizing (certain planned for) educational practices with the Studynet to move on from (i.e. as the one platform and yellow pages strategies suggest) – at HBC, the movements involved in engagements with the Studynet are better described as perpetually mobile, ontologically multiple and coexisting processes of mobilizing (in-) compatibilities – partial (dis-)connections and constitutive entanglements – workings – in relationships between the Studynet and the everyday living relating to HBC. This description involves acknowledging that both the Studynet and HBC exist through engagement work in processes of translations that involve continuous makeovers of the ontologically multiple make-ups and, thus, partially existing identities of each and both – as they become partially, collectively gathered. To see and understand these complex movements, however, one needs to engage in multiple ways of moving the contexts of knowledges and engagements involving the Studynet.

Thus, as we saw in-between chapters 1, 2 and 3, Chapter 4 further illustrates the suggestion that moving the contexts of knowledges and engagements may be another methodological key to understanding the ways in which ICTs take part in and become part of moving the everyday living relating to education.

Chapter 6 illustrates how moving space-timings for engagements with the Studynet as a partially connecting actor produce different boundaries for what discussion with the Studynet is comprised of, what it partially contains as well as how it is partially contained by everyday living at HBC. While chapters 3 and 4 have been mainly occupied with variations of efforts to make ‘it’ (e.g. the Assignment and Assignment Delivery functionalities, the Discussion functionality, the class and subject sites) work, Chapter 6 engages variations of efforts to reworking the ontological compositionings of what discussions and assignments may entail.
CHAPTER 5: MOVEMENTS AND STANDING STILL?!

SHIFTING MOVEMENTS AND VARIATIONS WITHIN

Chapter 5 may appear to be oddly placed in this thesis. The reader might ask whether it ought not to have been placed as part of the introduction. I have purposely placed Chapter 5 and what it partially contains here, because I want to represent it – as all the other constitutive entanglements in this thesis – in a particular way. Chapter 5 would have played a different role had it appeared in the beginning of the thesis. If placed there, it would more likely have appeared to be playing the role of providing a kind of research context – in the sense that this is the context that frames things. Of course, I cannot guarantee what readers’ movements will be, but I can at least partially construct the thesis to guide the order in which the chapters will be read. Had I placed Chapter 5, for example, at the beginning of the thesis, I would have moved the constitutive entanglements in certain ways that would have been different from their current state.

The space-timings of things matter. Things and how they are sequenced, i.e. what appears before and after or what is old and new – partially exist inside constitutive entanglements and the passages between them. Chapters 1-4 are aligned to partially illustrate these points in a variety of ways. Vignette 1 describes this research as engaging with what I call a moving science or science ‘of’ movements. All research can be claimed to be engaging with in some way or another, understanding movements. I argued, for example in Chapter 3, that there is a difference between engaging in a particular theory about movements, and in engaging with attempts to partially understand variations of coexisting and evolving theories and enactments of movements.

In Chapter 5, I engage in a discussion of some of the coexisting and coevolving movements and understandings of movements that I see partially represented at HBC and partially represented in e-learning research literature. This chapter concludes by suggesting that another methodological key to understanding the ways in which ICTs take part and become part of moving everyday living may be to engage in understanding shifting movements and variations within.

HBC: Perpetually mobile or standing still?!

The imaginary that at some point education will be well prepared and ready for engaging in various activities involving ICTs does not cohere with the ongoing movements of the everyday living related to HBC. They ‘never’ seem to reach this final
level of satisfaction, and both the starting and endpoints – as illustrated in the previous chapters – appear to be multiple, heterogeneous and continuously on the move. Both Hillerød Business College and the Studynet are labels for ontologically multiple phenomena that partially contain and become partially contained by many heterogeneous actors and, therefore, continuously move with the constitutive entanglements that momentarily make up both of them, also individually. While we may continue to call these phenomena HBC and the Studynet, they are never the same at any time, for anyone, anywhere. Furthermore, numerous other labels may engage these phenomena, e.g. sometimes the Studynet becomes Outlook, sometimes Assignment functionalities, and sometimes e-learning. Sometimes HBC is HG, HHX, an e-learning day, an E-learning Group or an history class. There is no singular and all encompassing way to describe HBC and the Studynet as actors that would do either of them justice.

Until now, I have been primarily concerned with describing the Studynet as a perpetually moving actor. Involved in these descriptions have also been the condition that each description has also partially entailed variations of descriptions of HBC and its multiple heterogeneous constitutive entanglements. In this chapter, I briefly illustrate some of the ways in which HBC in the 2004-2005 and 2005-2006 school years may be viewed as a perpetually mobile actor, an actor that, when you take a picture of the physical school premises (e.g. in the Trollesminde Allé department), may not appear to be particularly mobile, but when engaging with the continuous introductions of new actors taking part in its constitutive entanglements (e.g. video projectors, wireless Internet connections, the merger with another business college, educational reforms, structuration instruments like the Student Plan, etc.), it makes HBC appear perpetually mobile and therefore not only the platformations engaging the Studynet but also Hillerød Business College and the ways it may be viewed as organized can be understood as partially undergoing continuous changes.

Even though this may be viewed as a basic condition of the everyday living at HBC that I became involved with, it appears to be a condition that is not necessarily visible to John. In February 2008 telephone conversation, for example, John claims: “If you came to visit us today, you wouldn’t be able to tell the difference. Nothing has changed.”

John made this remark when he described the many new activities and relationships stemming from events such as the merger with another business college, HBC’s membership in the newly established National Knowledge Center for E-learning, the upgrade from SharePoint 2003 to SharePoint 2007, and the addition of a so-called

171 Telephone conversation with the head of quality and communication at Hillerød Business College (HBC) on February 25, 2008 – approximately two and a half years after I finished my studies at HBC.
Chapter 5: Movements and standing still?!

SharePoint Learning Kit to the Studynet, etc. Yet, in between these informations, John claims that if I were to visit today (2008), HBC would not have visibly changed since the 2004-2005 and 2005-2006 school years; I would not be able see any differences between then and now. When our telephone conversation took place, I found it remarkable that he could describe – almost in the same breath – so many new actors in the constitutive entanglements of HBC and still see no changes. Even if John’s comment was primarily related to the everyday engagements with ICTs, or perhaps even more specifically, the Studynet, his remark still surprised me.

Still, when familiar with some of the relationships inside which things may appear to be, according to John standing still, his remark is perhaps not so surprising after all. The merger with another business education did bring a lot of movements with it, and since John and his engagements were moved as well, his description of changes and standing still in more or less the same breath is actually not unexpected. In a sense, numerous changes were and had been effectuated. At the same time, the direction and progress of things that John, Joelle and the other human actors associated with HBC in the 2004-2005 and 2005-2006 school years had been moving towards can be viewed as having been temporarily set back. But perhaps not in the sense that what was going on in the ‘original’ HBC departments had been generally set back, perhaps more in the sense that John was now engaging with five departments, two of which were just starting to engage with the Studynet. And, furthermore, in the sense that the new business college – after the merger – was under new management, which – according to John – did not support the engagement work in the same way as the ‘old’ HBC management did. In some senses, they were starting all over again.

It is important to remember that John had a specific relationship with Hillerød Business College, where his role in the organization was, for example, to further the enactment of relationships between ICTs and education – or what they also called e-learning – at HBC, which is now known as Hillerød Business College Copenhagen North.

Although I have not visited the former HBC again, I am convinced that numerous changes have taken place. For instance, when I was no longer gathering empirical data for my research, many classrooms in the Trollesminde Allé department were getting their own video projectors. The move from SharePoint 2003 to 2007 and the addition of Class Server to the Studynet may have also brought about changes. These additions, however, as already discussed, may be difficult to engage with and see, for instance, because they are not general and immediately visible from any one snapshot of the situation, e.g. through screenshots of the Studynet, the satisfaction surveys or conversations. Furthermore, since all these changes involve partially tearing apart and constituting entanglements they also involve partially reworking things. This implies...
that what worked, what was imagined to end up working, and what works were and are continuously being partially reconfigured. In this sense, some of the things that e.g. John imagined as having started to work, may in fact now appear to be not working, or it may appear that some of the initial technical trouble may have returned. As a result, standing still or maybe even moving backwards is what John is experiencing. Overall, John’s role as an IT promoter in the organization could be said to be partially set back in the sense that before the merger, he generally felt that progress was being made with the introduction of the Studynet to the everyday living associated with HBC. In 2008, the progress had become differently partially contained and containing.

Environments within

The way we engage with movements influences the ways we may be able to see and engage with them. This is quite a paradox. John sees (non-)movements in particular ways that makes some situations appear as unchanged and standing still. In this chapter, I use conversations with John as a way to engage with this problematic, but it is a problematic that – as will be demonstrated later – I believe is a major part of the constitutive entanglements that have until recently and still continue to influence e-learning research in Denmark – and internationally.

As mentioned, de Laet and Mol (2000) engage with what they call environments within. Strathern (2000) discusses how social anthropologists look at the concept of culture in two (overall) ways: One is to view human activity as culture, and the environment as existing outside this as just landscapes that may influence – constrain or enable – human activity. The other way is to engage with so-called world views, and in Strathern’s argument these approaches involve entirely bypassing the sense of an outside environment. Strathern’s point is that either approach dismisses the fact that engaging with either imagination produces the ‘insides’ and ‘outsides’ of things, and furthermore, each imagination also produces variations of relationships between ‘ins’ and ‘outs’. Strathern argues that when imagining e.g. that a forest is outside a village, this produces the notion that the forest and the village, in turn, may be viewed as a variation of one another. The forest becomes outside inside relationships, with the village being inside. In a sense, the forest partially contains the village but the village also partially contains the forest. As an analogy, picture a house and a yard. Upon entering a yard from the street, Euro-American societies generally picture walking into the yard from the street. When entering a yard from a house, the image is of walking out into the yard from the house we were just in. Thus, the yard may be both enacted as an outside to the house and as an inside to the street. The yard is being differently partially contained by the street and the house, and it partially contains the street and the house as well. In this sense, we may talk about environments as being within.
Directionings

Chapter 2 argues that the directionings of working with ICTs are also partially produced inside the specificities of relationships and passages between specificities. What produces these specificities as well as passages between specificities is not stable. Chapter 3, among other things, also illustrates this. Strathern (1996) argues that belonging to the imaginaries of new and old is the enactment of something being enabled. This is what partially lies in the new. Thinking in terms of the new also involves imagining that society, the world, is going somewhere. This means, according to Strathern, that values and movements are associated. What is valued (or not) influences the ways in which we imagine movements as well as standing still. The effect of this imagination of a moving world is twofold: It produces the effect that any event can be related to this moving world, and inside this relationship people, things and events may appear as either diverging or converging. Furthermore, Strathern writes:

Second, the idea of a trend itself subsumes a kind of journeying unity. Whatever diverse bits and pieces it is made up of, society as such is inevitably and for better or for worse going forward. Thus what a social scientist may discern as a social trend may also involve the valuing of society itself … If Euro-Americans … invented modernity, they reinvented tradition as pre-modern. Modernism consists in, among other things, the difference between the modern and the traditional. (1996, p. 40.)

One of Strathern’s important points is that identifying what is modern and traditional is involved in distinguishing between the two. This means that if we imagine that we know either one, we can also identify what is traditional and what is not. Inserted into this movement is also that what is produced as belonging to each side of this divide breaks with the ‘other’ at the same time as it coexists with the ‘other’. One effect is that whenever one is occupied with one side of the divide, the other side is being coproduced. This, of course, is not particular to the imaginary of the old and the new. I take Strathern’s point to be that any enactment of movements – therefore also the enactments included in this thesis – must be understood as particularly produced.

Chapter 3 illustrates how the movements associated with HBC’s introduction of the Studynet to HG and HHX (in focus here) everyday living are more complex than what can be described in terms of something new entering something old and vice versa. Throughout this thesis I attempt – in keeping with Strathern – to illustrate in multiple ways that movements in the everyday living associated with ICTs can also be viewed as being partially containing and partially contained – in other words as partially existing – in ontologically multiple and heterogeneous ways. As Strathern argues, there exist several variations of (some of which she claims to pertain to Euro-American) ways of
seeing, engaging and enacting movements and standing still.\footnote{Strathern (1996) writes, for example, about modern versus tradition, new versus old, innovation versus tradition.} Rather than seeing them as being diametrically opposed, they can be engaged with as partially containing each other. They can be understood as partially existing environments within.

One variation of the co-production of movement and standing still is to hold a particular variation of what it means to move or not move as a general basis for comparing and understanding the apparent status of things. Strathern argues (1996) that in a modern world the promise of technology is often understood as innovation, which is understood as existing in contrast to a traditional world. This modernist enactment is also what partially produces John’s understanding of things as not having moved. Another conversation with John in which he comments on the present state (October 2005) of the organization of teaching activities at HBC also illustrates his perception of things not having moved. When discussing how to organize teaching activities, classroom teaching sometimes appears to be categorically boxed-in as a particular (old) general container for activities that more or less manage to continuously stay the same. John refers to classroom teaching as living its own very tough life: “And it [classroom teaching] must be allowed to live its own life, because there are strengths in doing so, but we are also under the impression that when it comes to the use of a variety of forms of teaching, the percentage of classroom teaching is too high.”\footnote{Recorded conversation with John and Joelle, conducted by Hansbøl, October 5, 2005.} First, John refers to classroom teaching in the singular, as if everything that goes on inside classrooms can be categorized in the same way. He comments that classroom teaching has strengths but it is one form out of ‘other’ forms which takes up too much time. This chapter illustrates that a more or less commonly accepted way of approaching classroom teaching in Danish e-learning research literature is as if it represents a traditional form outside other new forms. This is, I argue, a problematic approach, when one wishes to engage in understanding the movements in everyday living associated with the introduction of ICTs. In pursuit of this interest – in addition to the arguments presented in Chapter 3 – not taking any particular enactments of movements as the natural starting point of things is necessary to the extent possible, though particular movements may very well be enacted as natural in a variety of contexts, e.g. as illustrated in Chapter 2.

Before turning to the ways in which Danish e-learning research literature tends to depict movements with ICTs in education, I briefly elaborate further upon the description of some of the concrete ways in which HBC moved during and after my engagements with HBC. I engage with these descriptions as another way to illustrate that the space-timings of the introduction of the Studynet, HBC and my research matter. These constitutive entanglements are important to keep in mind when considering the
conclusions presented in this thesis. Chapters 1-4 illustrate the variations of constitutive entanglements – ways of moving the contexts of engagements and knowledge – associated with this research and the introduction of the Studynet, but Chapter 5 is constructed as part of the argumentation that when seeking to understand movements, it is central to not only pursue one particular variation of movements and variations within, but also to engage in understanding the multiple shifting co-productions of movements and variations within. The central argument here is to keep alert concerning shifts in constitutive entanglements, i.e. what partially contains and what is partially contained as/in movements and variations.

Although some readers may think that I tend to repeat my points unnecessarily, my aim is for this chapter to engage a bit differently with, though at the same time also strengthening, the points already made. My claim is that any movement may be viewed as both partially containing and being partially contained by things. But – and this is important – this is a specific generality. It does not make what partially contains or what is being partially contained a general matter. Movements are presented here as specificities that exist in-between specificities. There exist variations of ways to imagine, enact and engage with these specificities and their constitutive entanglements, and this is what I would like to illustrate in yet another way in this chapter.

First story: Classrooms as variations within

During the conversation on October 5, 2005 between John, Joelle and me, I comment on several alterations taking place in the classrooms that may become actors in moving what makes classrooms classrooms and classroom teaching classroom teaching. At the time of the conversation, video projectors have just been installed in several classrooms in the Trollesminde Allé department. The installation of projectors in classrooms enables teachers and students to jointly engage in activities like showing PowerPoint presentations, visiting homepages, etc. by projecting them onto a widescreen in class. These alterations of the materialities of classrooms, however, are just one example of the ongoing movements of the sociomaterial relationships which engage classrooms. Classrooms may be understood as partially containing and being partially contained in a variety of ways. Strathern (2004) makes the point that the ‘other’ is also within. Thus, to deem classroom teaching a thing in itself, which represents a variation outside ‘other’ variations in education, is one way of imagining ‘its’ relationships. Moreover, it is a way that contributes to the establishment of imaginaries that even though things move, classrooms may still stay the same. The same can be said about John’s imaginary that even though many things have moved what used to be HBC, another visit to HBC would show no changes. This imaginary also holds a particular variation of movement as existing outside HBC.
On October 5, 2005 John expresses that the percentage of classroom teaching is too high, but what does this refer to? In this conversation it refers to other variations of organizing teaching activities such as group work and individual work. But a percentage of classroom teaching that is too high is an expression that is difficult to relate to, because it does not refer to something measurable and generalizable. John sees classroom teaching as a form of teaching that should not take up too much time. As discussed later in this chapter, classroom teaching has increasingly become something which is classified as belonging to the (old/traditional) instructivist teaching paradigm, and thus deemed of lesser value. To move in educational terms, is often depicted as moving away from classroom teaching, which is imagined to be a container of instructivist and teacher centered forms of teaching, learning and education, towards constructivist teaching, which imagined to be a container of ‘other’ more student and learner centered collaborative, interactive and dialogic forms of teaching/education. I believe that, although not specifically expressed like this by John, it is partially inside this imaginary of things that John concludes that the amount of classroom teaching is too high. However, John – or anyone else for that matter – does not actually know what the exact percentage should be for an appropriate amount of classroom teaching.

John also comments that students often find that the teachers talk too much. He suggests that this is most likely connected with teachers standing at the blackboard getting carried away with hearing their own voices. Thus, John’s imaginary about classroom teaching as being too excessive seems to be linked with a particular association of what it means to engage in classroom teaching:

- A teacher standing at the blackboard
- A teacher doing the talking
- Students and teachers being inside a classroom

Of course, multiple ways of engaging classrooms in educational activities exist, and this is also something that John, the students, teachers and leaders that I talk to at HBC are firmly aware of. In my conversations and interviews with students, they say that classroom teaching is not necessarily bad. The value of classroom teaching is a relational matter that partially involves the engagements of the teacher, the students, the materialities of the classroom, and the subject matter. Classroom agency also depends on the ways in which classroom activities become partially associated with other events (e.g. exams, project work, and individual assignments) in everyday living.

When articulating the ways in which things become entangled, arguments are partially – as illustrated, for example, in Chapter 4 – made through particular imaginaries of the connectedness ‘of’ things. As shown in Chapter 4, movements from particular instances
to general discussions about phenomena may occur in conversations. This, however, does not imply that in either of the conversations that took place that John, for example, is not firmly aware of many of the specificities that matter. It seems to be a part of what it means to configure things – put things into figure – as also Latour has argued (e.g. 1986), that the specificities of things become partially and momentarily (in-)visible. In this case, if classroom teaching is indeed a form which involves a teacher standing at the blackboard and doing all the talking in a standardized/standardizable (procedural) way, then variations exist outside this practice. But, if classroom teaching is understood as just a way of classifying many events that somehow or another partially connect students and teachers with being in classrooms, then classrooms may involve multiple variations of ways to organize teaching activities. Group and individual work may take place equally inside or in relation to classrooms, and the so-called lecturing of teachers in classrooms may equally become partially associated with variations of group and individual work.

Particular variations of teaching activities are inherent to neither classrooms nor teachers’ lecturing. Good or bad, too little or too much of particular forms of teaching are not properties of teaching activities, but rather are to be found in the sociomaterial entanglements inside which variations of teachings become enacted.

**Partially existing movements and variations**

*Variation* is not a property of any one thing, but emerges out of the relationships through which some things appear to vary. Variations can be both other to and within (e.g. Strathern, 2004 & Mol, 2002). If we imagine that e.g. classroom teaching exists as a form outside other forms, then it becomes a variation which is other to these. But if we imagine classroom teaching to be a form that partially exists inside the entanglements with things and that things are partially mutually inclusive, partially contained by and containing each other, then classroom teachings may become ontologically multiple. Classroom teaching may become a form that partially contains other forms and is partially contained by other forms. Forms – in other words – also coexist interobjectively.

Another issue involved in recognizing this aspect of entanglements is that it means that movements related to one form may also take part in partially moving other forms that exist interobjectively with this form, e.g. if projectors are introduced into classrooms the different sociomaterial entanglements relating to these classrooms may also (but not necessarily) become altered. These movements of things may be more or less articulated, visible and radical. Movements are always relational matters, and hence, hardly ever easy to forecast. In cases where things appear to be (too) easy to forecast,
Latour (2005) suggests that we should remain extra curious as this may be a sign of complex relationships becoming simplified, naturalized and taken for granted. In the previous chapters, I present a variety of ways to descriptively and practically frame movements and variations within. In other words, I have tried to engage the reader in understanding movements and variations as partially existing relational matters that may take many forms and that may take part in forming things in many ways. In the ongoing course of this research multiple movements have been engaged. Movements of me, the project, the human actors related to HBC, the materialities of HBC, the Studynet and other ICTs, HBC and its partnerships, etc. Thus, although engaging with research in which HBC has become an actor, it does not imply that studying education has been a matter of engaging with one coherent thing. I have not uncovered a ground for others to return to. Instead, I have attempted to illustrate and open up suggestions for how we can engage with some of the complex ways in which changes in education relate to ongoing partially existing movements, translations and associations of things in the everyday living associated with education.

Second story: Moving organizational entanglements

During my engagements with HBC, many people moved in and out of HBC. New students, leaders and teachers have been added to HBC and ‘old’ students, leaders, teachers, etc. have left. In this sense, the everyday organizations of things can also be viewed as perpetually on the move. In September 2004 when I visited HBC for the first time, John and Joelle had their offices in two separate geographical locations in the municipality of Hillerød, which is a rather large town in the northern part of Zealand, Denmark. At the time, HBC consisted of three geographically distributed departments, two of which were located in Hillerød and one in the municipality of Frederikssund, which is approximately a half hour drive from the other two locations. At the beginning of the 2004-2005 school year, IT support and the head of quality and communication were located an approximately ten-minute bus ride from the town of Hillerød on Trollesminde Allé in an industrial area with other industrial and business oriented schools and business academies. The e-learning coordinator, on the other hand, was located in the office and educational buildings in Hillerød on Carlsbergvej right near the train line to, for example, Copenhagen. In the beginning Joelle was the local e-learning coordinator for the business academy, while John was a part-time HHX history teacher, the head of quality and communication, and the overall e-learning and IT supporter at HBC. HG and HHX were both represented at the Trollesminde Allé locations. I first contacted HBC by communicating via e-mail with John. He invited me to take part in the newly constituted E-learning Group, which would assemble delegates from each of HBC’s three locations, as well as from each of the educational departments. John was the main initiator of the E-learning Group, which was comprised of teachers, leaders, IT
support staff, the e-learning coordinator, the head of quality and communication, and a researcher (me).

The commissioning of the E-learning Group was written, as follows, by John and accepted by the group members:

The group is given the task of:

- Formulating e-learning strategies for the school and discussing how to define e-learning
- As a continuation of the first point, actively participating in furthering the implementation of the school’s educational strategy for the three learning spaces
- Implementing the school’s aims and strategies for knowledge sharing
- Initiating pedagogical discussions in educational advisory meetings, teams and other forums
- Evaluating the usability of the Studynet
- Discussing the effects of the changes taking place in administrative and educational processes
- Providing input for the further development of the Studynet, especially in the area of e-learning (in collaboration with NNIT)
- Conducting e-learning courses for each other
- Making our teaching activities available for Mikala Hansbøl for her PhD project
- Participating in writing questions for the annual satisfaction surveys in November (students/employees)

Established in August 2004, the group is to remain active until August 2007.174

To begin with, the E-learning Group was meant to exist for three years. After one year, however, the E-learning Group was dissolved because HBC underwent several transformations in the process of merging with another existing business college – hereafter referred to as The Business College (TBC) to become a new education program. As part of the engagement in the merger of the two education programs, several changes in the everyday organization of things took place with increasing intensity, especially as of the spring 2005 when the upcoming merger was made official.

During my primary contact with HBC, mostly during the 2004-2005 school year (and only minimally in 2005-2006), several important movements related to the daily organization of HBC as well as its entanglements occurred.

John: … Joelle is now an important person in the implementation of e-learning.
Mikala: Yes? More important than before?
John: Yes …175

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In October 2005, Joelle and John let me know that John moved his office to Carlsbergvej in Hillerød as part of the merger process and that Joelle is now going to be engaged part-time with arranging workshops and introduction seminars focusing on the Studynet (which she is already used to doing) and with assisting teachers in getting started with engaging the Studynet in their activities (which is something new). She explains that, inspired by Bonnie Nardi, she sees herself as a sort of gardener. The rest of her job will be dedicated to the school homepage. During the 2004-2005 school year, Joelle was exclusively a resource for business academy education but currently (October 2005) works for all of the departments. John has also become a delegate for the entire organization, which after the merger, consists of five departments. IT support takes care of the technical implementation of ICTs and Joelle and John promote and engage in the facilitation of what they call the pedagogical implementations of ICTs. John, however, also explains that he will be focusing on the merger.

Joelle and John say that being a gardener means you have to have a technical and teaching background. John emphasizes that it is not just about getting a discussion forum to work. Joelle, as a gardener, takes the learning perspective. Furthermore, inspired by the TBC departments, they are planning to introduce IT promoters and IT supporters everywhere. Each team of teachers is supposed to have an IT promoter who can assist with virtual forms of teaching and each department is supposed to have IT supporters who can assist with functionalities, e.g. answering questions about how to put a text in bold? Promoters and supporters are supposed to be teachers that receive additional resources for engaging in these roles.

In the beginning John emphasized what he calls the cascades strategy. He remarks that the new initiatives involve hard core approaches.

John: … at the TBC department it is explicitly stated in teachers’ contracts that they are required to spend time using ICT in their teaching. This means that it has now become a legitimate topic during our annual staff development interviews. So they are a little more … you can hear the cascades strategy … I don’t think that they have moved much more, even though they have had BlackBoard [their e-learning system] for approximately 5 years or more. But they have taken a much more hard core approach. My next dream is to get Thomas from the IT department engaged as the person who will look at SharePoint, which is becoming more and more the center of attention. The next step is for us to invest in a journalization system for SharePoint. Paul [from the Microsoft education team] will take care of the integration into Navision Stat, which we can have. This way it can generate reports for SharePoint, so that SharePoint will become the motor. The new homepage, which is a transition homepage, will be substituted with Microsoft’s CMS SharePoint solution in

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175 Recorded conversation with John and Joelle, conducted by Hansbøl, October 5, 2005.
November 2006, when it is launched. This is what we are targeting now. So SharePoint, yes … Five years from now it may not even exist … But this is definitely our IT strategy. And I would like to use IT Thomas even more. He is also going to be doing support, which is fine when things become tricky, but I would also like him to be the one who looks at things from a development perspective and who surfs around SharePoint, Knowledge Sharing and figuring out what parts of the web we can develop, while also simultaneously streamlining and optimizing solutions. He’d love that, so getting all these resources activated would be really great … because in that regard we have not had enough …

In October 2005 John talks about the merger as giving a lift. He says that the plan is for the TBC departments to engage with the Studynet as an intranet (which means only the news page and document libraries) in January-February 2006 and then, in the summer of 2006, completely abandon BlackBoard, and embrace the Studynet.

These movements partially illustrate some aspects of the ongoing fabrication of things in the complex everyday living with ICTs related to HBC. The merger involves establishing new entanglements of things. The new associations transform HBC’s divisions and the TBC departments. The new engagements influence the possibilities of working in the directions previously planned for, and also in planning the future direction of things. It is inside these everyday entanglements changes and developments relating to ICTs also must be understood.

John explains that as a part of the merger they will also participate in a new agreement on IT operating expenditures covering several education programs that – to the extent possible – aim for the same IT solutions. This set up provides new opportunities but also affects their options available for working in the directions they previously planned on.

Mikala: What will happen in November [2005]?
John: We’ll reorganize the domains, which is a part of the IT operating expenditures agreement we are part of … This is of course something that those of us from Hillerød have had to adjust to concerning the merger. Because we’ve had other strategies, and we don’t want to be constrained by people who say, hey, hey, wait … we have to formally talk about this with everybody. It has to fall into place. It has not fallen into place yet.

The ambitions, visions, strategies, plans and efforts that are in progress or in the pipeline may become altered and never realized or only partially realized as new actors, just as a merger or an IT operating expenditures agreement partially translate the everyday living.

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176 Recorded conversation with John and Joelle, conducted by Hansbøl, October 5, 2005.
177 Recorded conversation with John and Joelle, conducted by Hansbøl, October 5, 2005.
Most of the observations, participation, conversations, collations of materials, collaborations with human actors associated with this research, etc. relate to the 2004-2005 school year and the Trollesminde Allé premises in Hillerød. During the 2005-2006 school year, I was mainly in contact with John and Joelle at their offices, at the time, on Carlsbergvej in Hillerød, and I had access to the on-line activities on the Studynet. For 2006-2007 school year, I was on maternity leave and had one meeting with John at his office location at TBC. During the 2007-2008 school year, I conducted a few telephone conversations and one meeting with John at TBC. At the end of 2008, John had changed jobs.

The space-timings ‘of’ research

When I engaged with HBC in the course of this research, HBC partially contained things and HBC was partially contained by things. However, HBC did not stay the same and thus neither contained nor was contained by the same things in the same ways. What mattered differed. The merger and new HG and HHX reforms are concrete examples of this. In the beginning of the 2004-2005 school year, there was no talk about HBC merging with other programs. The focus of John and Joelle’s work was the implementation of HBC’s then new ICT – the school’s new so-called knowledge sharing system, the Studynet, in teaching activities. During the 2005-2006 school year, the new upper secondary school program reform was a major concern of HHX teachers and leaders. Other changes included new ministerial executive orders and the 2005 HG reform as well as the renovation of one of the HG buildings on Trollesminde Allé which meant that the teachers and students affected had to temporarily move to the Carlsbergvej facilities. All of these matters took part in moving the entanglements of everyday living at HBC. This, in turn, involved moving the contexts of engagements and knowledge that could become engaged in association with this research and the introduction of the Studynet in the everyday living associated with HBC.

The space-timings of research matters and the use of space-timing here should be understood as the matters that are (dis-)assembled in those particular moments when researchers engage with things. Research therefore partially (dis-)connects. This is a condition. There are always some things that do or do not become included in the collations and assemblages made by researchers, and what is included always partially exists, meaning that matters included in research always exist inside entanglements, all of which are not fully represented in research reports. Things matter differently (to the actors at HBC as well as to me) at various moments of gathering empirical materials. Things do not matter equally and are not equally granted space for movements at any time. In the beginning of the 2004-2005 school year there was a certain space for
movements with the Studynet in relation to teaching activities as well as in relation to John and Joelle’s activities. At the end of the 2004-2005 school year and beginning of the 2005-2006 school year, educational reforms and the merger engaged the Studynet in different chains of associations and enacted different space-timings for engagements. Quite specifically, in November 2005, the HBC domains were closed down, and thus for a period, access to the Studynet was simply not possible. The prospect of the Studynet not being available for an unforeseeable amount of time as well as the multiple other engagements demanding attention took part in creating a space where, as John expresses it: “… it seems as if suddenly a whole school year has passed us by again, and we don’t feel as if we have moved”. 178

Researchers’ movements relate to the space-timings of the things we set out to research, but they also relate to the particular ways in which researchers move around as part of their research. The research presented here would have been very different if I had focused on the 2005-2006 school year. It would also have been different if I had included more emphasis on the multiple meetings and events relating to the new HG and HHX reforms.

Other examples of the ways in which my research has partially included some and not other aspects of the constitutive entanglements of everyday living associated with HBC and the introduction of the Studynet is represented in the teachers’ canteen at HBC and the presence or absence, in general, of other HG teachers. During lunchtime, sitting at certain tables means engaging with HG teachers, while sitting at other tables means engaging with HHX teachers. Who one talks to can also depend on whether a teacher is a smoker or a non-smoker. At the Trollesminde Allé department there was also a group of HG teachers that I never came close to engaging with, because they were never actually physically present in the teachers’ canteen where I ate. This group of teachers could mainly be found in one of the HG buildings called E House. I only actually became aware of this quite by coincidence. Another example I became aware of concerning the ways in which my research has partially included some and not other aspects of the constitutive entanglements of everyday living associated with HBC and the introduction of the Studynet stems from a conversation I had with John and Joelle in which John talked about a group of HG teachers that was not present at the E-learning Day the E-learning Group had arranged at the beginning of the 2005-2006 school year, an event I was also unable to attend due to another commitment. This group of HG teachers was now at the Carlsbergvej location and John and Joelle wanted to arrange an E-learning Day for them. Joelle explained that I probably did not know this group of teachers, because they were not present in the places where I had been.

178 Recorded conversation with John and Joelle, conducted by Hansbøl, October 5, 2005.
Third story: Moving contexts of engagements and knowledge

Wherever we go, whenever we enact things, whoever, whatever and however we engage with things involve moving the contexts of engagements and knowledge for research, and thus also what partially transports the matters we are concerned with. In the case of this research, I became involved with the E-learning Group at HBC. As a member of the E-learning Group I became partially associated with multiple space-time actors relating to HBC. Furthermore, John’s open invitation to let me take part in ongoing conversations as well as various activities became an invaluable means for me to understand and engage with the everyday entanglements involved in enacting relationships with the Studynet at HBC. The progress meetings and conversations with John and Joelle illustrate another entrance to involving moving contexts of knowledges and engagements. They partially constitute contexts of knowledges and engagements, and they partially constitute means for engaging with the shifting contexts of knowledges and engagements enacted and emerging within the practices associated with HBC.

Joelle: Well, until now we have not changed that much. I have received a few more questions from the teachers who have now been transferred [from John] to me. But we need to get started with the teaching again. And we need to think differently compared to before about the ways in which the teachers should teach.
Mikala: Are you thinking about the Studynet?
Joelle: Yes, the Studynet. But I am also working on assignments for teachers now. For example, I am currently making syllabuses. And now I have new activities focused on evaluation that I need to look at. Then there will be some activities on the Studynet, but they are the kinds of activities that I think they should also work on alone.
Mikala: It sounds interesting, but what is it … could you please tell me … you’ve been asked to do something else compared to before? Or your role has been redefined?
Joelle: Well, not really … we haven’t actually articulated what my role is. Have we?
John: Let’s do that now, okay? [Everyone laughs]
Joelle: Yeah, I would like that …

While participating in progress meetings and conversations with John and Joelle served the purpose of partially moving the contexts of knowledges and engagements of my research, they also – as also illustrated in Chapter 4 – took part in moving relationships in the everyday living associated with HBC. Furthermore, they took part in making shifting engagements and moving relationships in the everyday living associated with HBC partially visible. The remarks quoted above illustrate that what is in focus in

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179 Recorded conversation with John and Joelle, conducted by Hansbøl, October 5, 2005.
everyday living continuously shifts. One minute it is the curriculum and evaluations and the next minute it is portfolios and Student Plans, all of which are activities related to the educational reforms. The merger also brings with it shifting relationships and engagements.

Joelle: … for example, a concrete activity from yesterday when I visited a teacher who was experiencing trouble with correcting assignments. Then I can visit her personally to help her instead of just talking on the phone. And now there is another teacher who’s experiencing trouble with a survey he made … Then I can look at it. We were also able to do this before, but now they know that they can contact me and I can come over to help them. So, I’m a gardener.

Mikala: This is really interesting. And you didn’t really have this function?

John: No, well, we did operate like this at Trollesminde Allé, but now I’m not at Trollesminde Allé anymore, and I have to look at things from the perspective of the merger. So I cannot provide this service. When I receive mails like this it’s because I used to be located at Trollesminde Allé, and they know that John handles this kind of thing. Now I forward things more and more to Joelle.¹⁸⁰

Describing the activities associated with HBC in the form of particular circumstances – in the singular or even the plural – standing around the engagement work with the Studynet would not necessarily include the shifting entanglements that take part in reproducing the constitutive entanglements that make up what partially contains HBC and what HBC partially contains. Thinking in terms of partially existing movements and variations within requires not losing sight of shifting constitutive entanglements. They may involve particular imaginaries of the ways in which ICTs become part of and take part in moving things. So far, this chapter illustrates how many actors and shifting relationships take part in enacting the ways in which the Studynet becomes part of and takes part in moving the everyday living associated with the basic vocational and commercial upper secondary programs at HBC. Chapters 1-4 argue that any engagement must be understood as partially existing and thus also partially (dis-) engaging. The remainder of this chapter introduces some of the ways in which Danish e-learning research literature depicts relationships between ICTs and education.

E-learning as a means of engaging in the Information Society

In recent years, Denmark has been repeatedly listed as one of the world’s top leaders regarding the use and diffusion of ICT in society as a whole – at home, in education, in social services and in the job sector (see e.g. Ministry of Education, 2003 & the OECD, 2004). Denmark is generally claimed to have one of the highest levels of technology in the world (see e.g. the Danish Ministry of Science, Technology and Innovation, 2003 & Dalsgaard, 2008). The World Economic Forum’s Global Information Technology

¹⁸⁰ Recorded conversation with John and Joelle, conducted by Hansbøl, October 5, 2005.
Chapter 5: Movements and standing still?! 

*Report 2008-2009* places\(^{181}\) Denmark as “as the most networked economy in the world for the third consecutive year” (Dutta & Mia, 2009, Index, p. 2).

E-learning is often envisioned as a means for *lifelong learning* in the Information Society, and lifelong learning is described as a necessary activity in highly digitalized societies that wish to keep their leading positions. What matters in the Information Society is *knowledge* as it is driven by the knowledge economy: The ability of a society to produce, select, adapt, commercialize, and use knowledge is critical for sustained economic growth and improved living standards. Knowledge has become the most important factor in economic development … Today, economic growth is as much a process of knowledge accumulation as of capital accumulation” (World Bank, 2002, pp. 6-7). According to the World Bank, we are living in the Information Society in a *global world governed by a knowledge economy*, which involves the condition that we must keep engaging in the production of new knowledge. This is envisioned to be tightly connected with our skills and competencies to advance, distribute and use new technologies.

In 1999, in the article *Learning, Technology, and Education Reform in the Knowledge Age, or “We’re Wired, Webbed, and Windowed, Now What?”* Trilling and Hood present an instructional paradigm shift which they argue correlates with the move from the Industrial Age to the Knowledge Age. They claim that year 2000 marked the tenth year anniversary of the arrival of the Knowledge Age in the United States:

> In 1991, U.S. spending for Industrial Age capital goods – things like engines, electrical distribution, metalworking and materials handling machinery, industrial equipment for mining, oil fields, agriculture, construction, etc., a total of $107 billion – was exceeded for the first time in U.S. history by the spending for information technology – computers and telecommunications hardware and software – which grew to a record $112 billion. This historic shift marks Year One of the Knowledge Age …

(Trilling & Hood, 1999, p. 1 – note omitted)

Trilling and Hood’s article, which is often referred to in Danish e-learning research literature (i.e. Ryberg, 2007; Buhl, Holm Sørensen & Meyer, 2006; Meyer, 2006; Holm Sørensen, 2005), provides part of the context necessary for understanding the tendency

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\(^{181}\) “The NRI 2008–2009 covers a record number of 134 economies (up from 127 in last year’s edition) from both the developed and developing world, accounting for over 98 percent of world GDP. The Networked Readiness Framework, underpinning the NRI and stable since 2002, measures: the presence of an ICT-conducive environment, by taking into consideration a number of features of the broad business environment, some regulatory aspects, and the soft and hard infrastructure for ICT; the degree of preparation needed to use ICT for the three main national stakeholders—individuals, the business sector, and the government; and the actual use of ICT by the above three stakeholders.” (Dutta & Mia, 2009, Index, p.2)
to depict ICT integration and e-learning in education as a matter of societal developments – progression – requiring that education move from the Industrial Age to the Knowledge Age’s learning practices:

This turning point, decades in the making, forever tilts the balance of what is valued in our work and our society. This, in turn, changes what is needed to prepare for life and work in our society – the main concern of education. At this transition, where the very purpose of education – cultivating knowledge and skills – becomes the centerpiece of our age, it is only appropriate to pause and take a fresh look at education and learning in our society and the new roles they will play as our Knowledge Age unfolds.

(Trilling & Hood, 1999, p. 2)

The societal move from the Industrial Age to the Knowledge Age is a widely established assumption today, in Denmark as well as internationally (e.g. Ministry of Finance, 2005; Ryberg, 2007; Qvortrup, 2006). According to Trilling and Hood, societal changes bring an educational paradox: How is it possible to educate students to participate in the Knowledge Age when educational practices in fact take their point of departure in goals, skills and ways of learning that are constructed for the purposes of preparing the students for participation in the Industrial Age? Using this framework as their point of departure for the challenges education faces, the authors argue for the need for an educational paradigm shift, which means new formulations of educational goals, new skills, new educational practices facilitating new ways of learning, and, overall, new educational learning environments. They present a model of the Industrial Age versus the Knowledge Age instructional and learning practices:

<table>
<thead>
<tr>
<th>Industrial Age</th>
<th>Knowledge Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher-as-director</td>
<td>Teacher-as-facilitator, guide, consultant</td>
</tr>
<tr>
<td>Teacher-as-knowledge source</td>
<td>Teacher-as-co-learner</td>
</tr>
<tr>
<td>Curriculum-directed learning</td>
<td>Student-directed learning</td>
</tr>
<tr>
<td>Time-slotted, rigidly scheduled learning</td>
<td>Open, flexible, on-demand learning</td>
</tr>
<tr>
<td>Primarily fact-based</td>
<td>Primarily project and problem-based</td>
</tr>
<tr>
<td>Theoretical, abstract principles and surveys</td>
<td>Real-world, concrete actions and reflections</td>
</tr>
<tr>
<td>Drill and practice</td>
<td>Inquiry and design</td>
</tr>
<tr>
<td>Rules and procedures</td>
<td>Discovery and invention</td>
</tr>
<tr>
<td>Competitive</td>
<td>Collaborative</td>
</tr>
<tr>
<td>Classroom-focused</td>
<td>Community-focused</td>
</tr>
<tr>
<td>Prescribed results</td>
<td>Open-ended results</td>
</tr>
<tr>
<td>Conform to the norm</td>
<td>Creative diversity</td>
</tr>
<tr>
<td>Computers-as-subject of study</td>
<td>Computers-as-tool for all learning</td>
</tr>
<tr>
<td>Static media presentations</td>
<td>Dynamic multimedia interactions</td>
</tr>
<tr>
<td>Classroom-bound communication</td>
<td>Worldwide-unbounded communication</td>
</tr>
<tr>
<td>Test-assessed by norms</td>
<td>Performance-assessed by experts, mentors, peers and self</td>
</tr>
</tbody>
</table>

Based on Trilling and Hood (1999, p. 11).
Chapter 5: Movements and standing still?!

As the above table demonstrates, much in line with Strathern’s argumentation, this depiction of the new versus the old takes part in enacting what is new (innovation) and what is old (tradition). This alignment of things in turn has the effect that what is described as belonging to the old is what is needed to move away from, while needing – as Trilling and Hood put it – to move towards the new. This imaginary of a paradigm shift in education can be related to what I call (social) constructivist movements in science which is associated with new theories about learning and knowledge. Trilling and Hood’s depiction of the educational/instructional paradigm shift represents imaginaries of ICT integration in schools as tightly connected with movements from the traditional to the new Information Society schools. It is an imaginary that has – as will be demonstrated – formed part of the foundations of much research on relationships between ICTs, learning processes and education in Denmark.

Prinds calls this paradigm shift a global tendency to move from a focus on teaching and the teacher to a focus on learning and the learner (Prinds, 1999, p. 28). Heilesen and Bækkelund Jensen (2003) also comment on the tendency in the second half of the twentieth century to replace the word teaching/instruction with learning. This tendency is reflected in the concept of e-learning which often refers to matters of arranging education and instruction with ICTs in ways that are imagined to support learning. In relation to primary and secondary education in Denmark, researchers mostly refer to learning potentials with ICT. The term e-learning is highly connected to distance education ideas about net-based and net-supported forms of education. Only recently has experience with these forms of education been related to general education (Dirckinck-Holmfeld & Fibiger, 2002). As my focus is on the ways in which a knowledge sharing system – the Studynet – becomes part of and takes part in moving education, my concern is variations of enactments of the ways in which ICTs (may/can/ought to) become part of and take part in moving education.

E-learning science as part of (social) constructivist movements

In terms of Danish history, the more systematic use of computers as media for communication exploded around 1990 when the use of e-mail and the World Wide Web took off. According to Bøgh Andersen et al. (2005), this is also the point at which computer systems, i.e. intranets for collaboration/cooperation – also called computer-supported cooperative work (CSCW) systems – were developed. Humanistic ICT research is claimed (ibid.) to have significantly expanded since the 1990s in Denmark. The rapid diffusion of computers and Internet connections into homes during the 1990s contributed to making ICTs more than just work tools and technical objects, which created the basis for additional humanistic ICT research. Disciplines like sociology, organizational theory, ethnography, anthropology, psychology, communication and
media studies became central participants for understanding ICTs and their uses (ibid., p. 25). Also, research focused on ICT and education/learning has become a widely and rapidly spreading multi-disciplinary field of research. In 1997, humanistic ICT research was still a relatively small research area and counted 10-20 researchers in Denmark; by 2002, it had become a somewhat established field of research in Denmark and counted 50-60 researchers (ibid., p. 16). According to Bøgh Andersen et al.’s report on ICT as a humanistic issue, there were approximately 300 humanistic ICT researchers in Denmark in 2004 (ibid., p. 16). Internationally, research dealing with relations between ICTs and education can be traced back to the 1960s (Atwell et al., 2003, p. 19).

Even though research on e-learning – relationships between ICT and learning/instruction/education – has now become a well-recognized field of research in Denmark, it is still a fairly new field in terms of having its own conferences, research programs, researcher networks and journals. Furthermore, it is an extremely heterogeneous field, both theoretically, methodologically, and in terms of the disciplines involved as well as the issues and ICTs dealt with. This makes it difficult to make any final conclusions about the progress of e-learning research in Denmark – especially internationally. However, there have been some central influences in Denmark on the research on ICT and learning. Atwell et al. divide e-learning into the following time periods:

<table>
<thead>
<tr>
<th>Decade</th>
<th>Type</th>
<th>Concept of Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960s</td>
<td>Computer-based training</td>
<td>Automation</td>
</tr>
<tr>
<td>1970s</td>
<td>Intelligent tutoring systems</td>
<td>Automation</td>
</tr>
<tr>
<td>1980s</td>
<td>Micro world tools for production</td>
<td>Toy, construction media</td>
</tr>
<tr>
<td>1990s</td>
<td>Computer-supported</td>
<td>Asynchronous tools communication</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Collaborative learning and collaboration</td>
</tr>
<tr>
<td>2000s</td>
<td>Virtual learning environments/Blended learning</td>
<td>Multi modal infrastructure Synchronous and asynchronous tools</td>
</tr>
</tbody>
</table>

Based on Atwell et al. (2003, p. 18)

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182 The 6th European Conference on e-Learning was held in Copenhagen on October 4-5, 2007.
183 For example, the research program, Media and ICT in a Learning Perspective, was launched in 2001 at the Danish University of Education (see: http://www.dpu.dk/site.aspx?p=3914). E-learning Lab – Center for User Driven Innovation, Learning and Design was launched in 2001 at Aalborg University (see: http://www.ell.aau.dk/). The Research Unit on Science, Technology and Learning was launched in 2000 when Learning Lab Denmark at the Danish University of Education was established (see: http://www.dpu.dk/site.aspx?p=7939). The Center for IT and Learning (CIL), launched in 2004, was organized as a project when the Information and Media Studies program was established at Aarhus University (see: http://www.cil.au.dk/cil/praesenatttion). The Danish Research Center on Education and Advanced Media Materials (DREAM), established in 2004, is a research consortium consisting of three Danish universities: Roskilde University, the Danish University of Education and the University of Southern Denmark (see: http://www.dream.sdu.dk/index.php?lang=Engelsk).
Theoretically, e-learning research in Denmark has been highly influenced by the field of computer-supported collaborative learning (CSCL). This field, which Timothy Koschmann (1996) introduced as an emerging paradigm as of approximately 1989 (the first European conference on CSCL was Euro-CSCL 2001, see Koschmann, Hall & Miyaki, 2002), has especially gained importance in Denmark in relation to distance education, which is called mix-mode or blended learning in Denmark because the Danish tradition emphasizes that distance education should be hybrid-forms consisting of a mix of face-to-face and net-based instruction and thus net-supported rather than net-based (Heilesen & Bækkelund Jensen, 2003; Bang, 2003).

The research field of computer-supported collaborative learning (CSCL) emerged in the early and mid 1990s and represents perspectives from different theoretical approaches: social constructivism, Soviet socio-cultural theories and theories of situated cognition (Koschmann, 1996, p. 13) – merging into one research field with a focus on ICT and learning as matters relating to social and cultural contexts. CSCL is a research field that emerged as an alternative to earlier research fields approaching learning and instructional technologies as primarily psychological matters (ibid. p.10). According to Lipponen (2001, p.19) the CSCL research field also partly emerged with inspiration from research being done on computer-supported collaborative work (CSCW). CSCL approaches include a focus on intra-, inter- and extra-classroom activities with ICT (Koschmann, 1996, p.14); emphasis on effects of or effects with CSCL (Lipponen, 2001, p.23); and a concentration on collaboration through 1) interactions at the computers, 2) interactions around computers, 3) interactions related to computer applications, and 4) interactions through computers (ibid. p.21). In other words, CSCL is interested in computer-mediated learning activities, and the unit of analysis is social interactions involving computers.

In 2004, when I studied CSCL literature closely (i.e. Koschmann, 1996 & Koschmann, Hall & Miyake, 2002), I noticed that CSCL research seemed to primarily focus on the distributed aspect of computer-supported collaborative learning processes as being a matter of geographical distribution. There seemed to be a tendency in empirical CSCL analyses to focus either on what was going on in face-to-face contexts around or with computers and on what was going on in on-line contexts through the means of computer-based technologies (Jensen, 2005 also notes this). In the first example the distributed aspect is not taken into consideration and in the latter the distributed aspect is put in relation to the fact that people engaging in so-called net-mediated activities are distributed geographically. At the time, few researchers (e.g. Georgsen & Raudaskoski, 2002; Fjuk & Ludvigsen, 2001) appear to have made the distributed aspect of learning

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184 The first CSCL workshop took place in 1990 (Koschmann, 1994), and the first international CSCL conference was held in 1995 (Lipponen, 2001, p.19).
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intertwined with multiple variations of entanglements and coexistences of on- and off-line contexts the centre of attention and unit of analysis within CSCL.

In Denmark, Aalborg University has been a center for proponents of CSCL research (see for example Sorensen, 2002; Dirckinck-Holmfeld, 2002 & 2002a), which is partially why Danish variations of CSCL have been highly inspired by problem-oriented project pedagogy, the situated learning approach (Lave & Wenger, 1991) and Etienne Wenger’s (1998) social theory of learning in communities of practice. Furthermore, in 1999, Fjuk and Holmfeld (Dirckinck-Holmfeld, 2002) came up with the approach computer supported distributed collaborative learning (CSdCL) in order to stress the distributed nature of collaborative learning. This is also referred to as the Scandinavian approach (ibid.). In Denmark CSCL has had its greatest influence on research in net-supported, higher education activities – both in relation to regular university studies and in-service training. CSCL approaches in Denmark have had a strong social constructivist orientation (Levinsen, 2005).

There has been and still exists in research on e-learning a sort of hype in Denmark around a particular educational way of using ICT as a means for learning: Learning through computer-mediated communication (CMC). Especially so-called text-based computer-mediated asynchronous communication (also referred to as communication in threaded conferences in virtual learning environments) has been in focus. According to Dirckinck-Holmfeld (2002), this is partially related to the fact that the first generation of so-called virtual learning environments (VLE) was based on computer conferencing. The hype, however, also relates to the fact that distance education in Denmark has primarily impacted higher education, providing opportunities for adults to become part time master’s degree students in net-supported, so-called flexible education while simultaneously working full-time. The obvious advantage of CMC is the possibility of interaction through text-based communication without being geographically in the same place at the same time. However, as Sorensen (2002a) writes, the flexibility that working and learning together while being geographically apart offers also becomes a challenge in this kind of educational activity because education needs to work explicitly on supporting learner experiences of participating in a shared educational context. In relation to CMC as a means for learning, Danish researchers have brought in various theoretical approaches with a particular interest in communication (e.g. Bakhtin & Bateson in Birch Andreasen, 2003; Luhmann in Rattleff, 2003 and Mathiasen, 2003b).

Although the theoretical points of departure for e-learning in Denmark are manifold, they are generally influenced by (social) constructivist orientations within learning theory. One book (Mathiasen, 2003a), for example, has at least eighteen different

185 Though still referring to geographic distribution.
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Theories in play. The issues included by e-learning researchers are diverse as well as numerous: Digital portfolios, digital logbooks, simulations, digital evaluations, language learning, training programs, virtual learning environments, knowledge management, learning management, digital learning objects, webquests, podcasting, project work, case-based learning (CBL), problem-based learning (PBL), chat, IT didactic design, media projects, media literacies, Internet search, weblogs, wikis, computer-based reading and writing, media pedagogy, IT pedagogy, serious games, power users of technology, mobile learning, social learning games, visual culture, animations, user interfaces and accessibility, media esthetics, virtual worlds, youth and technologies, and web 2.0 e-learning, etc. Just to mention a few. Every project involves particular ICTs and claims about the learning potential related to them.

In relation to primary and secondary education, e-learning research in Denmark mostly focuses on ICTs in relation to on-campus activities with ICTs. Much of this research – which chiefly focuses on primary education – has been conducted for the research program Media and ICT in a Learning Perspective at the Danish School of Education, Aarhus University. This research program focuses on exploring the untapped learning potential connected with ICTs.

Much e-learning research is conducted in relation to development projects or in other variations of experimental settings (e.g. researching and developing new ICTs, pedagogical methods, and didactic designs) and researchers are concerned with moving education from Industrial Age schools to Knowledge Age schools (e.g. Ryberg, 2007).

In-between dichotomies

E-learning is entangled with imaginaries of the capacities of ICT to move relationships between time and place. The common assumption is that either we are dealing with a continuum of same time – different time or same place – different place. Depicting time-place relations in this way entails the imaginary that the more we are together in the same place and time in education – usually referred to as face-to-face (f2f) – the more education can be characterized as time-place dependent. ICTs are depicted (e.g. by the Danish Ministry of Science, Technology and Innovation, 2003) as enablers for ways to interact without these strings attached.

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186 Multiple on-line sources exist that provide valuable insights into the many different research interests e-learning researchers have engaged with. See for example: http://www.futurelab.org.uk/resources/publications_reports_articles/literature_reviews and: http://partners.becta.org.uk/index.php?option=rhandcatcode=re_rp_02_aandrid=13660.

187 Ryberg calls them knowledge creation schools.
Describing educational activities with ICTs in this manner places ‘traditional’ face-to-face on-campus education in the same time – same place quadrant and net-based/distance education activities in the different time – different place quadrant. In this way of thinking place is a matter of being geographically situated in a physical/real place, e.g. a school, and time becomes a matter of so-called synchronicity, also often referred to as real time.

Based on this description it is hardly surprising that in e-learning research in Denmark ICT-mediated learning has been described as having the potential to liberate learning from the constraints of conventional classroom instruction, which is bound by time and place (see e.g. Dirckinck-Holmfeld & Fibiger, 2002). When learning, instruction and education are ICT-mediated, they are most often labeled as computer-mediated, which is enacted in research literature as something new in contrast to conventional models of learning, instruction and education. In plain speaking, conventional educational methods are enacted in contrast to computer-mediated educational methods. The conventional/traditional education is imagined to be supportive of learning through immediate and instantaneous as well as geographical and time-bounded social interactions inside classrooms. In this sense research enacts a dichotomous split between the new and the old (both in the singular).

Latour discusses these basic assumptions about face-to-face interactions as being matters of synchronicity and immediacy.

Interactions do not resemble a picnic where all the food is gathered on the spot by the participants, but rather a reception given by some unknown sponsors who have staged everything down to the last detail – even the place to sit might be already pre-inscribed by some attentive keeper.
So, it is perfectly true to say that any given interaction seems to overflow with elements which are already in the situation coming from some other time, some other place, and generated by some other agency. This powerful intuition is as old as the social sciences. As I have said earlier, action is always dislocated, articulated, delegated, translated. Thus, if any observer is faithful to the direction suggested by this overflow, she will be led away from any given interaction to some other places, other times, and other agencies that appear to have molded them into shape. It is as if a strong wind forbade anyone to stick to the local site and blew bystanders away; as if a strong current was always forcing us to abandon the local scene.

(Latour, 2005, p. 166)

Latour’s point is important in relation to e-learning research that takes its point of departure in imaginaries of so-called computer-mediated or net-based activities being able to provide what local face-to-face interactions cannot.

Mol (2002) and Latour (2005) emphasize that things in the living world coexist and cohabitate. One way of depicting the coexistence and cohabitation of things is through the enactment of contrasts, i.e. as same place vs. different place, same time vs. different time, and old versus new. When depicting relations between time and place like this, researchers a priori take for granted that they are not dealing with things that involve multiple ways of timing and spacing things. Either things are imagined to relate to the same time or different times. Things cannot exist as both parts of same and different space-timings. Either things exist in one place or different places, but not both.

Places are understood as being geographically bound and regional, and time is understood as sequences, where we can either meet in locations at the same time or we cannot meet. Based on this construction, the ability to meet virtually without being geographically bound is quite an impressive leap. However, this leap is only impressive in relation to the imaginary and it also produces the effect that we imagine that we are in fact dealing with separate places: Virtual vs. physical/geographic. ICTs allow us to meet virtually. The virtual becomes imagined as a new place/context we inhabit. But the very act of differentiating between the virtual and the physical also inserts that we need to build bridges between the two dimensions, and furthermore, it enacts the imaginary that we can move between old and new places as well as enact cross-contextual spaces not previously possible. This imaginary thus involves a problem: If the physical and virtual worlds are two distinct places, then how can we connect them?

As noted earlier, Strathern makes the point that any connection is another disconnection (2004). This means that when enacting the physical and virtual as separate aspects, they are also connected through this disconnection. Another way of approaching what is physical and virtual is to understand them as coexisting aspects of everyday living that
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are not matters of whether or not we engage with ICTs. Strathern (2000a) and Latour (1998) discuss the concept of *virtual*. Strathern explains:

‘Virtual’ started off as a reference to the physical qualities (or virtues) which things have, and to the effects of these qualities, like the virtual heat of wine or of sunshine. It then came to describe the state of being effective or potent. Not until the seventeenth century was the term first used of the essence or effect of qualities by themselves, so that things could be called virtual – as one might refer to a ruler who was a virtual sovereign – in reference to qualities that were not endowed in formal or ‘actual’ terms. The point is that virtual entities point to their own potency: The virtual sovereign did not need to crowned. Such efficacy appears not to need the props of human social relations or wider contexts of activity.

(Strathern, 2000a, p. 2)

Strathern points to the imaginary that virtual entities are enacted as *not real* in the sense that virtual spaces are de-contextualized and de-materialized spaces. Another aspect of the distinction between what is physical and what is virtual is thus real vs. not real. Strathern suggests that what is not real is what is usually perceived as the potency of what is virtual. Latour (1998) notes that the so-called virtual spaces of the Internet materialize societal relationships in many ways. In this sense, the Internet can be understood as very material. That which is virtual – Latour provocatively suggests – may in fact be more material than real. Referring to Deleuze’s coupling of ‘Potential and Actual’ and ‘Virtual and Real’, Latour suggests that when thinking in terms of realizing potential, we imagine that we can predict the outcome of things. When thinking in terms of realizing virtuality, it is not a matter of actualizing potential because:

… what is in the realization of Virtuality is unpredictable. It’s an event, to use the term that Deleuzes uses often. …we can re-use the word Virtual, not to mean disembodied or to mean de-localised, but to mean something different, which is, can it produce new Virtualities into the Society? That is, can it end up producing a different Society?


The actualization of potential produces, according to Latour, no new information. Latour uses the movements of a pendulum as an analogy. When set in motion the movements of a pendulum are (usually) not surprising. When set in motion, we already know what the potential movements that will be actualized are. They are measurable. On the other hand realization of virtuality is unforeseeable and surprising. In contrast to the special quality pertaining to new spaces provided by ICTs that e-learning researchers assign the so-called virtual, Latour understands it as an ubiquitous aspect of everyday living, for example, when reading a book, going to the supermarket, or imagining that we live in a Information Society. The analogy of the pendulum is similar
to Latour’s time-space traveler who moved by train – a familiar technology. Latour’s point – as I understand it – is that what lies in the virtuality of everyday living is not foreseeable because the fate of things lies in the hands of others (Latour, 1991).

When e-learning research starts by assuming the relationships between time and place, new and old, and virtual and real as matters of contrasts, this inserts a particular construction of the coherence of things, which becomes a part of the ways in which researchers understand things, i.e. relationships between ICTs, learning processes and education, as well as their space-timings. These constructions take part in how researchers construct research designs and gather and collate research materials.

**Instructional paradigms and ICT**

Danish e-learning researchers have had a tendency to place education, teaching and learning in relation to the imaginary of a paradigm shift and progression in education from the old/conventional/traditional *instructivist* schools of the past to the new/innovative/creative *constructivist* schools of the future. In 1999, as already mentioned, Trilling and Hood – though not using exactly these words - depicted this revolution. This particular depiction of the movement of things is illustrated in a variety of ways in Danish e-learning literature. Heilesen and Bækkelund Jensen, for instance, depict the paradigm shift as a continuum between *instructivist* and *constructivist pedagogies* and relate them to ICTs:

<table>
<thead>
<tr>
<th>Instructivist</th>
<th>Pedagogy</th>
<th>Constructivist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training</td>
<td>Method</td>
<td>Problem-oriented project work</td>
</tr>
<tr>
<td>Learning skills</td>
<td>Purpose</td>
<td>Reflexive understanding</td>
</tr>
<tr>
<td>Individual work</td>
<td>Social context</td>
<td>Collaboration</td>
</tr>
<tr>
<td>Information search, filing</td>
<td>Functionality</td>
<td>Discussion</td>
</tr>
<tr>
<td>Instructional program, database</td>
<td>Technology</td>
<td>Conference system, CSCL/CSCW system</td>
</tr>
<tr>
<td>Simple applications</td>
<td></td>
<td>Complex applications</td>
</tr>
</tbody>
</table>

Based on Heilesen & Bækkelund Jensen (2003, p. 3)

Heilesen and Bækkelund Jensen’s model depicts ICTs in education on a scale moving from *simple* to *complex* applications. The Danish literature commonly describes instructivism in negative terms regarding what education should be moving away from. Heilesen and Bækkelund Jensen’s model enacts particular forms of teaching and learning as belonging, overall, to two learning philosophies. This means that some *educational practices become depicted as carrying instructivist* (including behaviorist
and cognitivist) forms of learning and knowledge. In Denmark it is quite common to imagine that particular didactic designs and instructional technologies \textit{a priori} represent learning philosophies and hence forms of learning potential in particular ways. ICT-didactic designs and instructional technologies are thus viewed as \textit{determining factors} conditioning the activities as well as the forms of learning that students will be able to engage with.

Both Sørensen’s and Heilesen and Bækkelund Jensen’s model enacts educational activities with ICTs as \textit{a priori} engaged in particular relationships with the human (e.g. teachers and students) and non-human (e.g. ICTs) actors involved in the activities. The input and outcome of these activities seem to be prepositioned. Erik Prinds’ book \textit{Spaces for Learning (Rum til læring)} (1999) also partially subscribes to this line of thinking. Inspired by the American educational researcher David Dwyer, he depicts the two instructional paradigms somewhat differently than Heilesen and Bækkelund Jensen:

<table>
<thead>
<tr>
<th></th>
<th>\textbf{Instruction}</th>
<th>\textbf{Construction}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom activity</td>
<td>Teacher centered</td>
<td>Student centered</td>
</tr>
<tr>
<td></td>
<td>Didactic</td>
<td>Interactive</td>
</tr>
<tr>
<td>Teacher role</td>
<td>Knowledge distribution</td>
<td>Collaborator</td>
</tr>
<tr>
<td></td>
<td>Expert</td>
<td>Sometimes the learner</td>
</tr>
<tr>
<td>Student role</td>
<td>Listening</td>
<td>Collaborator</td>
</tr>
<tr>
<td></td>
<td>Learning</td>
<td>Sometimes the expert</td>
</tr>
<tr>
<td>Essence of teaching</td>
<td>Facts</td>
<td>Relationships – coherence</td>
</tr>
<tr>
<td></td>
<td>Remembering</td>
<td>Understanding, investigating, studying</td>
</tr>
<tr>
<td>View of knowledge</td>
<td>Accumulation of \textit{facts}</td>
<td>Transformation of \textit{facts}</td>
</tr>
<tr>
<td>Success criterion</td>
<td>Quantity</td>
<td>Quality in understanding</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Norm reference</td>
<td>Criterion reference</td>
</tr>
<tr>
<td></td>
<td>Multiple choice</td>
<td>Logbook and achievements</td>
</tr>
<tr>
<td>Use of technology</td>
<td>Training and practice</td>
<td>Communication and collaboration</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Access to information</td>
</tr>
</tbody>
</table>

Based on Prinds (1999, p. 30)

Instead of rejecting either of the paradigms, Prinds presents a different variation of ways to depict what he calls \textit{learning spaces}. Prinds’ model includes \textit{three} learning spaces (developed for upper secondary schools and is used by HBC):
Even though Prinds mentions that the spaces are not to be understood as separate rooms but rather as interacting processes of learning, the model still presents instructional activities as being matters of organizing teaching, training and/or study spaces. Prinds also suggests that learning through instruction is more traditional, while learning by training is more like apprenticeship learning and learning by studying is similar to constructivist learning. He views training and studying as matters of social learning. Situated learning does not really belong in education, according to Prinds, as it belongs more to informal learning. Prinds is primarily concerned with face-to-face activities, and Internet communication is placed in the study space. Prinds, like Heilesen and Bækkelund Jensen, places ICT (in the singular) as having different general roles/functions inside the different learning spaces.

Behaviorist and cognitivist notions of learning and knowledge as merely matters of unproblematically transferring information became, in the twentieth century, (Bang, 2004) widely debated and contrasted with various constructivist understandings of learning and knowledge as processes of transformation involving humans’ active construction. These debates have echoed across the educational landscape and research in Denmark, especially with increased intensity in the last two decades. Today, constructivist understandings of learning are widely spread in Denmark (Illeris, 2007) and play a central role in pedagogy (Dalsgaard, 2004). After a focus on especially situated learning (Lave & Wenger, 1991) in the 1990s, it became widely accepted in Denmark that learning does not necessarily involve a teacher, and need not be a matter

188 Notably, Prinds has a different understanding of learning theories, e.g. Lave and Wenger’s theory of situated learning (1991), than the one I relate to. I understand their argument to be that any learning process must be understood as situated, and as I read Lave and Wenger, their work can be understood as a proposition – much in line with Latour, who Lave (1988) at least refers to in her earlier work – to dissolve a priori distinctions like abstract vs. concrete, formal vs. informal, etc. which have previously occupied and still, to some extent, occupy learning researchers. I refer to Prinds here to illustrate the imaginary that different ways of organizing educational spaces lead to different ways of learning and that instructional practices may represent learning theories.
of formal education and intentional learning scenarios. Situated learning approaches emphasize learning as a ubiquitous aspect of ongoing everyday living.\textsuperscript{189}

In Denmark (social) constructivist movements in educational research refer to many different theoretical figures (that do not necessarily refer to themselves as constructivists). As already mentioned Lave and Wenger (1991) and Etienne Wenger (1998), but also Jerome Bruner, who wrote the book \textit{The Culture of Education (Uddannelseskulturen)} published in 1996,\textsuperscript{190} are examples of literature that have influenced the constructivist movement in Denmark with a cultural psychological approach. Other strong influences have come from cultural-historical/socio-cultural/activity theory, e.g. Yrjö Engeström’s version (see Engeström, 2007) and Niklas Luhmann’s systems theory, which has also been widely referred to within ‘educational’ e-learning research in recent years in Denmark (e.g. Ratleff, 2003; Buhl, 2006; Mathiasen, 2006; Qvortrup 2006).

During especially the 1990s and up until today (2009), the constructivist movement in much Danish literature on e-learning has been described as a paradigm shift, which in turn is depicted in models of education as belonging to and embracing either ‘the old instructivist’ or ‘the new constructivist’ styles of education. The ‘new’ refers to the pursuit of ‘the future good and safe path’, which is believed to be a matter of preparing for the twenty-first century Information Society. Research with a focus on learning and ICTs in Denmark has widely taken for granted that this is indeed the direction educational developments are and should be taking. I suggest that these interconnected imaginaries have become naturalized – meaning researchers generally refer to them but do not question them. They have become part of the foundation for engagements in understanding relationships between ICTs, learning processes and education in Denmark. The imaginaries, however, influence the way researchers sort things out by inserting dichotomies, and in relation to these (a priori), ‘gaps’ in education between ‘the old’ and ‘the new’, ‘the good’ and the ‘bad’. In other words, taken together, these imaginaries take part in inserting points of scaling and valuing which, in effect, become part of enacting some education as having foundational problems when it comes to ICT integration.

\textsuperscript{189} Everyday living is not, in Lave’s (1988) use of the concept, to be understood as activities located outside, e.g. education and work: “‘Everyday’ is not a time of day, a social role, nor a set of activities, particular social occasions, or settings for activity. Instead, the everyday world is just that: what people do in daily, weekly, monthly, ordinary cycles of activity. A schoolteacher and pupils in the classroom are engaged in ‘everyday activity’ in the same sense as a person shopping for groceries in the supermarket after work and a scientist in the laboratory” (Lave, 1988, p. 15).

\textsuperscript{190} In Danish published as: \textit{Uddannelseskulturen}, see Bruner, 1998.
The construction of a paradigm shift inserts a particular relation in education that divides education and educational activities into those marked by success (following the new paradigm) and those marked by failure (following the old paradigm). Furthermore, the depiction of development as a progression, a natural evolution and revolution from one to the other by means of new learning philosophies and instructional practices, means that activities contained in ‘the old’ become amputated and cut off from activities contained in ‘the new’. The old versus new dichotomy is a modern, Euro-American (Latour, 1999; Strathern, 1996) way of understanding things as being either one or the other. When e-learning literature relates particular educational practices to particular theoretical movements and -ism’s, these representations take part in materializing educational practices as choices of enacting ‘good’ or ‘bad’ learning, learners, instruction, teachers and education.

Concluding that particular learning philosophies and particular (educational) practices necessarily go hand in hand is, however, at short cut. E-learning researchers make them connect, in a sense in this way; but as Lave and Wenger (1991) note, they do not intend their theory to be seen as a recipe prescribing ways to organize education. Instead, they see situated learning as an analytic and relational approach to understanding learning processes. Learning theories, may take part in efforts to understand, imagine and develop educational activities. It is, however, not a natural given in the order of things, that learning theories contain learning practices. Categorizing educational activities a priori and then relating them to the boxes containing the two -isms (instructivism vs. constructivism) enacts a particular space for understanding ‘educational’ activities. E-learning research related to primary and secondary schools in Denmark has been characterized as being particularly invested with interests in learning potentials. Thus, deciding a priori that some activities in education can be placed into the instructivist box and have nothing to do with the future, and hence, are not interesting to research may naturally become a choice for e-learning researchers. In other words, some activities may be cut off, separated out, marginalized and legitimized as the sort of things that are not interesting to begin with. This tendency to (dis-)connect models of instruction with particular theories of learning within the e-learning literature dates back in time. An example of this can be found in Koschmann (1996a, p. 16) who lists four paradigms for what he calls instructional technologies, their respective learning theoretical points of departure and related models of instruction:
Koschmann emphasizes that these paradigms are by no means exhaustive and recognizes that there are examples of research that does not fit these paradigms. However, using Koschmann’s list as a starting point, it seems that a good deal of the e-learning research conducted in Denmark today could go under the heading CSCL, thus emphasizing socially oriented theories of learning taking their point of departure in a model of instruction that focuses on collaborative learning and understands instruction as enacted in practice. Although useful in retrospectively creating an overview of developments within research, I do not believe that these categorizations and ways of boxing in movements in e-learning research are beneficial for studying and understanding e-learning, particularly because they provide an overly easy shortcut from looking at a list to concluding which kinds of instructional models, and hence educational activities, we as researchers should be pursuing today.

CSCL is described as both an instructional technology research paradigm and an instructional paradigm:

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191 The table gathers developments retrospectively. Thus, the table may be understood as an effect of certain gatherings. Each research movement is depicted as generally invested with certain theories of learning that are generally translated into instructional practices with ICTs. Research movements are depicted as generally consecutive and thus tables establish common grounds from where research can move. Either research may move away from what (in a unified and singular sense) has previously been done, or research may continue along those lines. Tables partake in a simplified visualization of scientific movements as well as in enacting and presenting past, present and future situations.
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The model of instruction underlying the work of CSCL is termed “collaborative learning.” Although it is easy to recognize examples of collaborative learning, it is difficult to provide a precise definition. “[some people have] … described it as “a reculturative process that helps students become members of knowledge communities whose common property is different from the common property of the knowledge communities they already belong to” … This definition, focusing on what collaborative learning is meant to accomplish, resonates with the view of learning as entry into a community of practice. [On the other hand, others have] “… described it as “the mutual engagement of participants in a coordinated effort to solve [a] problem together”… This latter definition highlights several facets of the method: A commitment to learning through doing, the engagement of learners in the cooperative (as opposed to competitive) pursuit of knowledge, the transition of the instructor’s role from authority and chief source of information to facilitator and resource guide. Examples of collaborative learning methods include Expeditionary learning…, Group Investigation…, Problem-Based Learning…, Project-Based Learning…, and other forms of small-group learning …”

(Koschmann, 1996a, p. 13 – notes and references omitted)

CSCL research is a varied field that has provided manifold groundbreaking contributions to knowledge about possible ways to establish relationships between learning processes and computer-based technologies. However, CSCL research, which partially moves from the imaginary of the paradigm shift and the necessity of a (social) constructivist turn, enacts e-learning in particular ways that take part in sorting out which activities are more interesting for researchers to engage with. In this sense, research areas with a strong theoretical commitment can be viewed as political means for enacting educational pasts, presents and futures. These particular scientific constructions may also take part in making education a success or a failure in relation to ICT integration. Research constructions like a paradigm shift serve as filtering and persuasion devices (Ellgaard Jensen, 2007), partially setting the future direction of research as well as instructional designs to be invoked in education. That e-learning research work as a filtering and persuasion device is represented in the ways e-learning research values and naturalizes certain educational practices.¹⁹² As previously mentioned in this chapter, John also relates to these imaginaries in his ways to approach, understand and value movements and teaching practices.

Christian Dalsgaard (2004) provides another more recent example of these a priori categorizations and framings of educational practices. Dalsgaard, whose purpose is to

¹⁹² Note that this is not necessarily viewed as a problem by CSCL researchers. It may be looked upon as a condition and a matter of focusing one’s research interests. Thus, acting as a filtering and persuasion device can be represented as an acknowledged and justified limitation in research that foregrounds some perspectives and not others. I am not criticizing the field of CSCL or all ‘other’ ‘previous’ scientific engagements in e-learning in Denmark. I am trying to engage with variations of enactments of ways in which ICTs become part of and take part in moving education.
describe how different pedagogical strategies can be extracted from learning theories, presents the following forms of teaching:

<table>
<thead>
<tr>
<th>Form of learning</th>
<th>Cognitivism (Howard Gardner)</th>
<th>Radical constructivism (E. von Glasersfeld)</th>
<th>Activity theory</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Controlled</td>
<td>Individual</td>
<td>Individual/social</td>
</tr>
<tr>
<td></td>
<td>- structured course</td>
<td>- flexible course</td>
<td>- flexible course</td>
</tr>
<tr>
<td></td>
<td>- individual</td>
<td>- individual/groups</td>
<td>- group collaboration</td>
</tr>
<tr>
<td>Content of learning</td>
<td>Point of departure in professionally and systematically organized units</td>
<td>Point of departure is students (problem) - problem situations - conclusive subjects</td>
<td>Point of departure is students (project) - problem oriented - projects</td>
</tr>
<tr>
<td></td>
<td>- syllabus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relations</td>
<td>Distribution and training</td>
<td>Supervision (coordination)</td>
<td>Coordination (supervision)</td>
</tr>
<tr>
<td></td>
<td>- subject of teaching and teacher</td>
<td>- students and teachers control - between students and teacher</td>
<td>- students control - between students</td>
</tr>
<tr>
<td></td>
<td>- from teacher to student</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on Dalsgaard (2004, pp. 249-251)

Dalsgaard argues that the above categorizations can be used as a means for making pedagogical judgments when choosing what he calls e-learning platforms and when evaluating their functionalities. In other words, first we have categorizations of learning theoretical approaches, which in turn become translated into particular imaginaries about suitable educational practices. In the ‘end’, they are translated into the imaginaries of the relevant functionalities of e-learning platforms.

Heilesen and Bækkelund Jensen’s, Prinds’ and Dalsgaard’s models exemplify a tendency within Danish e-learning literature to a priori categorize and naturalize categorizations of educational practices to be included (valued) or excluded (devaluated), depending on the particular worldviews represented as learning philosophies.

Today, the educational paradigm shift from instructivism to constructivism has become widely accepted as the naturally given direction of progress in education, in the sense that research publications simply appear to take this paradigm shift for granted. Neither the imaginary about the Information Society nor the expected and related changes in learning and instructional practices that supposedly ought to follow are questioned. The notions of the Information Society, the educational paradigm shift, and what I have termed the (social) constructivist movement are taken for granted and have thus become black boxes (Latour, 1999).
Chapter 5: Movements and standing still?!

An important issue that takes part in these imaginaries is the argument that what used to be considered beneficial learning practices and behaviours in the Industrial Age becomes the near opposite in the Knowledge Age (Trilling & Hood, 1999, p. 11). Various authors (e.g. Trilling & Hood, 1999; Holm-Sørensen 2005 & 2006) acknowledge that, in practice, education will most likely become a mixed construction of the two opposites viewed as a continuum. It is clear, however, throughout the texts that the authors applaud the leap from Industrial Age to Knowledge Age education, though they recognize that Knowledge Age education will always involve some Industrial Age practices. These practices, however, will (hopefully) not take up as much educational space. Prinds’ approach represents a variation which includes and values different teaching and learning practices, but his approach also boxes in what partially contains things (i.e. three learning spaces) and what things (e.g. student and teacher roles) may partially contain.

The literature in Denmark depicts ICTs as central to Denmark maintaining its position as one of the world’s leading Knowledge Age nations, but Trilling and Hood, interestingly, mention that most Knowledge Age learning practices do not require ICTs. They suggest that these practices have been in place since “Dewey’s turn-of-the-century Chicago Laboratory School” (Trilling & Hood, 1999, p. 11). They describe ICTs as important catalysts but emphasize that it is practices that are decisive. Furthermore, they warn that a paradigm shift will be particularly demanding for teachers, who will need to radically re-consider their own roles as teachers. In other words, the leap from one educational paradigm to the next will most likely not be clean and unproblematic.

Since the late 1990s it has been repeatedly argued that education is in somewhat of a crisis because and that although we are living in an Information Society, educational practices are still defined by Industrial Age practices to a very high degree. In spite of huge investments in so-called ICT infrastructures, competencies and R & D projects, the digital revolution always seems to remain slightly beyond reach (see e.g. Trilling & Hood, 1999; Prinds, 1999; Cuban, 2001; Geysner, 2001; Bryderup et al., 2002; Mathiasen, 2003; Langager 2006).¹⁹³ Apparently, we have entered a sort of twilight zone in education from which we do not know how to escape. This is represented in literature that keeps on engaging in the conversation about the school of tomorrow, and building for tomorrow’s world – in relation to imaginaries about twenty-first century education and the Knowledge Age. While we need to continuously put effort and energy into re-thinking our world-makings, e-learning research in Denmark is partially trapped

¹⁹³ References were chosen that cover more than just secondary schools to show that these basic assumptions are an important element in what drives the integration of ICT and e-learning in all areas of education in Denmark – and perhaps also internationally.
by the idea of a paradigm shift grounded in the imaginary of a (social) constructivist
turn, and the problem of always virtually being on the edge of the Information Society
but never actually getting there – except for some specific examples where whole
schools are turned into knowledge creation schools (Ryberg, 2007). In these cases, the
undertaking of building knowledge creation schools is a matter of fundamentally
rebuilding education or, literally, building new schools, new educational programs,
inventing new ways of organizing education, constructing new didactic designs and new
ways of facilitating learning environments based on imaginaries about the instruction,
learning and education practices of the Information Society. In other words, when we
engage in making educational worlds that fit these imaginaries, not surprisingly, they
turn out to be successful in ‘light’ of exactly these imaginaries. Furthermore, non-
successes become enacted in relation to the imaginary of being successful, which means
engaging in the paradigm shift and the metamorphosis of education transforming into
twenty-first century Information Society learning practices.

Substitution is an ongoing theme. In many Danish research publications, educational
development is depicted as a movement that ought to progress from ‘the old’ to ‘the
new’, i.e. a revolution. We are (or ought to be) moving from the Industrial Age
society’s production-oriented approaches and linear time structures (Langager, 2003) to
the digitalized, Information Society, which is imagined to have little in common with
the previous one. In this way Danish research publications often romanticize
development in the sense that pursuing development is depicted as a safe, general, much
needed route. As Søren Langager explains: “In the space of a few years the digital form
of communication has changed our imaginaries about relations between what a group is
and what a place represents” (2003, p. 199).

Digital technologies are imagined to be bringing social revolutions into society.
Therefore, education must follow suit. Langager claims that education should embrace
particular kinds of social interaction that become presented as, on the one hand, inherent
aspects of technologies, and yet, on the other hand, some people in teaching use the
digital options in traditional ways. This, according to the author, is problematic if
education is to prepare students for participation in a highly digitalized Information
Society.

Langager suggests that it all boils down to a matter of order versus chaos. Either the
new technologies can be introduced in education and handled with old forms of order or
they can be handled by embracing the new chaotic possibilities. These are the options.
Depicted in this manner, there really are no options. Either education chooses an
outdated traditional path or the safe future path of digital interference. Langager depicts
traditional ‘good learning culture’ as follows:
While traditional learning culture is depicted as an environment of control, the new learning culture of digital interferences stands out in contrast as chaotic movements. Langager paints the contrasts to raise the question of whether Information Society students entering school are merely to be considered as chaotic and problematic or whether education should perhaps change its traditional ways of doing education. This is an important question. And it is a recurring question in debates about societal and educational changes related to new ICTs. The core question is: Do technologies bring about societal changes that in turn should bring about educational changes? Langager explains: “The digital media’s challenge for pedagogy will in the coming years stand between, on the one hand, IT as tools for customary learning …, and on the other hand as media for different learning – the digital era’s ways of learning” (2003, p. 206).

In light of the above elaborations and discussion of Danish e-learning research, this is precisely the challenge teaching faces in Denmark. But this situation may be viewed as a partial consequence of certain ways of imagining and enacting progress with ICTs. If we keep enacting this dichotomy between the old and the new, we will continue to enact the challenge of moving from the old to the new. If we engage in another way of understanding development, we can enact the situation differently. Latour writes:

For ANT, if you stop making and remaking groups, you stop having groups. No reservoir of forces flowing from ‘social forces’ will help you. For sociologists of the social, the rule is order while decay, change, or creation are the exceptions. For the sociologist of associations, the rule is performance and what has to be explained, the troubling exceptions, are any type of stability over the long term and on a larger scale. It is as if, in the two schools, background and foreground were reversed”

(2005, p. 35)

Langager’s style of writing is highly polemic, and his article can partially be described as an early response to the political prioritization of and strong focus on auditing, testing, and control in Danish education in recent years that is represented, for example, by the focus on evidence based education (Moos et al., 2005). Langager, who puts things on the edge, presents an important educational dilemma in his discussions:

<table>
<thead>
<tr>
<th>Traditional learning culture</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Group (class logic)</td>
<td></td>
</tr>
<tr>
<td>Place bound (classrooms)</td>
<td></td>
</tr>
<tr>
<td>Social reference (taking care of each other)</td>
<td></td>
</tr>
<tr>
<td>Linearity (homogenously working together in the same rhythm of progression)</td>
<td></td>
</tr>
<tr>
<td>Synchronism (doing the same activity at the same time)</td>
<td></td>
</tr>
</tbody>
</table>

Based on Langager (2003, p. 204).
Can/should we embrace digital media in particular ways in order to engage in forms of learning that are more future-like and relevant?

From technology transfer to cultural turn-around projects

CSCL researchers Kolodner and Guzdial (1996) have raised the critique that most e-learning research deals with effects with ICT and not of ICT. Kolodner and Guzdial are concerned with the issues of learning transfer. How are things useful other than in the actual settings? Do students learn better with ICTs? What happens when there are no computers involved? How are things carried across contexts of activity? These questions raise classic learning problematics. However, asking the questions and framing them in this way also involves certain constructions. Kolodner and Guzdial refer to what they call traditional transmission-based classrooms on the one hand, and CSCL communities on the other hand. This paves the way for the authors to conclude that the things happening in CSCL communities do not happen in classrooms: “While students might do a project together in a more traditional classroom, students in CSCL communities not only do together, they also learn together” (Kolodner & Guzdial, 1996, p. 311).

The problem with Kolodner and Guzdial’s approach is that they imagine learning to be a somewhat immediate activity that can be enacted and studied as such. They also focus on activities as if they are easy to delineate. This is represented in the way that the authors refer to CSCL and classroom activities as containers for learning. While Kolodner and Guzdial speculate on the differences between projects in classrooms (based on assumptions about them) and projects in what they call CSCL communities (based on research), Estrid Sørensen (2005) has engaged in a comparison of different instructional activities involving various instructional resources like the blackboard and a virtual world environment. Sørensen’s PhD thesis illustrates how different instructional arrangements do not change the fact that knowledge is a collective accomplishment, and that knowledge practices are related to the sociomaterial relationships involved.

CSCL, a field of research that has developed greatly since its beginnings in 1989, has become more oriented towards the complex processes involved in realizing technologies in practice (Miyake & Koschmann, 2002). CSCL researcher Gerry Stahl writes:

The naïve, technology driven view was that tools … would make a significant difference on their own. The subsequent experience has been that the classroom culture bends such tools to its own interests and that this culture must be transformed before new media can mediate learning the way we had hoped they
Chapter 5: Movements and standing still?!

would. So CSCL research has necessarily and properly shifted from the affordances and effects of the technology to concerns with the instructional context.

(2002, p. 169)

This is the same problem Langager examines. ICTs affect the living world but the effects of ICTs alone are not naturally given in the order of things. Stahl, in line with Langager [who does not refer to CSCL], depicts CSCL as moving away from a technology-driven understanding towards being concerned with a cultural turnover of classroom culture. Until recently, quite a significant amount of research in Denmark has been conducted with the aim of studying the learning potential inherent to media and ICT (e.g. Buhl et al., 2006). The program description for the research program Media and ICT in a Learning Perspective provides an example of how research has described ICT and digital media as catalysts for educational changes:

Today, media and ICT play a central role at all levels of the education system, not least as catalysts for educational change. Developments in information and communication technology (ICT) will have a profound impact on the basic premises of pedagogy and give rise to a quest for educational theories and methodologies that can meet society’s demands for learning and teaching.”

(Research program Media and ICT in a Learning Perspective, 2001-2005)

However, while this may paraphrase Danish e-learning research, Danish e-learning research is better characterized as being invested with imaginaries of e-learning as matters of cultural turnover projects. Though still highly focused on the imaginary of a cultural turnover, some researchers have begun to look at movements with ICTs differently, e.g. Ryberg suggests a shift in focus from specific activities and the realization of potential with technologies to a focus on ICTs as part “… of an ecology of everyday life where it plays out and is used in relation to many other activities in young people’s lives” (2007, p. 397). According to Ryberg, research should focus more on how educational assemblages of learning environments are designed for learning to unfold. The focus on the overall educational design of learning environments has gained more interest in recent years in Denmark. Mostly though, these initiatives have been engaged with the imaginary of the need to make a cultural turnover. One example is the fundamental rebuilding of primary schools (e.g. Holm Sørensen, 2005 & 2006; Audon, 2006). Based on problem-oriented project pedagogy (POPP), this research and development project was partially inspired by Trilling and Hood’s (1999) description of Knowledge Age schools and by Etienne Wenger’s (1998) social theory of learning and communities of practices. Another example of research taking this direction deals with

194 This PhD thesis has been conducted in relation to the research program Media and ICT in a Learning Perspective. The program description, which was written in 2001 and covers 2001-2005 is currently under revision.
the design and development of so-called virtual learning environments for tertiary blended learning education (see e.g. Nyvang, Tolsby & Dirckinck-Holmfeld, 2004).

While e-learning research with an emphasis on cultural turn around projects has certainly made many important contributions to understanding and developing new ways to engage in education, in Denmark the overall situation is that ICTs mostly become integrated in ‘just-plain’ educational frames and everyday living that may not be characterized in such unidirectional and monocultural ways. ICTs are often viewed as either ‘just’ adding to or extending existing educational environments. Yet, there has been no previous (that I know of) attempts in Denmark to investigate these – in that sense – quite ‘normal’ forms of education – or what it is that makes these forms of education forms of education that engage with ICTs (in the plural) in the ways that they do. In fact, it seems that overall e-learning research has a tendency to not engage with educational activites where e-learning may appear problematic (Orngreen & Levinsen, 2007).

Danish e-learning research as asymmetric research

Often it is argued that the extent to which ICTs are used in educational practices for the acknowledged benefits that ICT offers is limited. Research shows that ICTs – among other things – can have a positive impact on pupils’ learning and subject-related performance as well as on improving their basic ICT skills. In addition, pupils are more motivated and attentive when computers and the Internet are used in class; ICT has a strong motivational effect as well as positive effects on behavior; and ICT allows for greater differentiation (especially in primary schools) because programs can be tailored to individual pupil’s needs, etc. The examples provided here are drawn from the ICT Impact Report: A Review of Studies of ICT Impact on Schools in Europe (Balanskat, Blamire & Kefala 2006).

There are, of course, innovative educational institutions and educators working progressively with the learning potential of ICTs as well as different ways of organizing teaching and learning with ICTs in education in Denmark. For the most part, however, the extent to which ICTs are used as mediums for learning in child, adolescent and adult education is mostly depicted as limited.

195 Like Lave (1988) I put ‘just-plain’ in quotation marks to problematize the imaginary that these schools may actually be thought of as just-plain.
196 This is often referred to as engaging ICTs in remediations, an imaginary discussed in Chapter 3.
197 For instance, as previously mentioned, primary schools are built with special attention being given to how the architecture of a school can support flexible learning environments and access to technology in everyday school life (http://www.skub.dk). Another example is mixed-mode master’s degrees with a focus on computer-supported collaborative learning (e.g. Master in ICT and Learning: http://www.hum.aau.dk/mil).
Researchers have various suggestions for the apparent lack of uptake for ICTs in education, for example:

- It is perhaps due to the fact that, at an international level, we still know very little about the learning possibilities that new ways of organizing education with ICT as a mediating tool actually give (Lipponen, 2001).
- Other important factors might be the fear of “technologizing” and de-humanizing education (Dreyfus, 2001).
- It is perhaps due to the fact that a major part of the educational system is still based on a didactical paradigm emphasizing classroom teaching and learning as a matter of instruction (Holm Sørensen et al., 2002; Ryberg, 2007).
- Technological possibilities.
- Barriers due to teacher’s poor competencies, limited access to ICT, and the educational system itself (Balanskat, Blamire & Kefala, 2006).

Most innovative use of ICT is supposedly happening outside educational contexts (Holm Sørensen, et al., 2002; Mediappro, 2006). Consequently, some researchers believe that studying learning resources derived from the innovative use of ICT inside as well as outside the institutional context of education is of special interest and relevance in order to further develop theory about as well as practices with ICT for learning and teaching purposes at a variety of educational levels. ICT integration in education has been connected with de-centering teaching and teachers (Prinds, 1999) as well as with centering on learning and learners; in other words, ICT has been imagined as a catalyst for the total re-design and re-invention of education, teaching and learning processes – as well as the roles of teachers and students.

A few projects have been conducted in Denmark on the relationships between learning processes and the use of ICT in children and young people’s everyday lives outside school (e.g. Holm Sørensen, 2002). Research has also been invested in workplace learning with ICT (e.g. Kanstrup, 2004). Mostly, however, research on e-learning in Denmark deals with educational and formal instructional ways of learning in relation to experimental research and development contexts. This means that most knowledge about relationships between ICTs, learning processes and education stems from very special situations with extraordinary resources, arranged more or less for the sake (and benefit) of research (e.g. Olesen, 2002; Ryberg, 2007), for the sake of realizing particular political educational goals (e.g. Mathiasen, 2003), and in order to design, develop and investigate particular future-oriented scenarios of learning potentials with ICT and digital media (e.g. Holm Sørensen, 2006). Quite a significant amount of research in Denmark deals with designing, testing and developing new ICTs for learning, new didactic designs and the introduction of new ICTs in schools. Research on
relationships between learning processes, ICT and education is mostly conducted as mixed research and development projects in which researchers often actively take part in the role of studying and developing activities. Research mostly concentrates on the following:

- Didactic design of ‘entirely’ new educational learning environments (sometimes new education programs) based on pedagogical strategies, e.g. Problem-Oriented Project Pedagogy and social learning theory (see e.g. Holm Sørensen, 2006; Dirckinck-Holmfeld & Fibiger, 2002).
- Whole class experiments with new technologies such as laptop computers (e.g. tablet PCs and laptop computers (see e.g. Knap & Lauridsen, 2006; Mathiasen, 2002).
- Didactic design of particular instructional activities (e.g. media projects, digital portfolios) based on pedagogical strategies and learning philosophies, e.g. Problem-Oriented Project Pedagogy, and social learning theory (e.g. Hansbøl & Langager, 2004; Hansbøl & Holm Sørensen, 2004).
- The development of new instructional ICTs, learning resources (see e.g. DREAM, footnote 183).

It seems fair to say that most e-learning research conducted in Denmark deals with new, unstable (Ryberg, 2007) and experimental practices as well as ICTs. In other words, e-learning research is often concerned with the out-of-the-extraordinary and aims to develop and invent new, innovative and relevant future educational technologies and practices, i.e. technologies and practices fit for an Information Society.

While a large amount of research documents significant learning potential with ICT in education, the world still seems to be waiting for a general turnover in educational organizations overall. This has led to different theories about what is needed: New educational buildings, more resources, more ICTs, better competencies, different beliefs and approaches, and the acceptance of new teacher and learner roles. In other words, ten years after Prinds and Trilling and Hood, history seems to be repeating itself. We need more, better and new has become the slogans schools repeat. Either ICTs, teachers or the educational frameworks are viewed as the problem. Lately, a lack of good leadership is also being pointed at (EVA, 2005).

Research findings suggest that it takes a considerable amount of work to work with ICT in education (Bang, 2004). This, however, is not something that separates education. No matter how education works to integrate ICTs in ‘educational’ everyday living, it takes a momentous amount of efforts. The everyday work with ICTs and the efforts to make ICTs work in ‘just-plain’ education, however, have not been an object of study in Danish e-learning research.
This research can be viewed as an attempt to open up engagements in studying the everyday efforts made to make ICTs (in the plural) actors in the everyday living associated with education. Claiming to study ICTs as actors in everyday living does not necessarily remove the experimental nature of the research. Long-term studies in relation to R & D projects (e.g. Holm Sørensen, 2006; Audon, 2006) also involve everyday living. Studying everyday living includes new ICTs and educational practices. Experimental approaches might in fact not be especially connected with the research. Being experimental might be an ubiquitous aspect of everyday living related to ICTs. Ryberg’s study on Power Users of Technology is conducted in an intentionally experimental setting; however, Ryberg’s thesis illustrates how everyday living is a part of experimental settings on as equal a footing as any other setting research sets out to investigate.

Thus, I do not claim to be engaging in everyday living as opposed to other e-learning researchers. But I wish to engage in understanding everyday living with ICTs without engaging in what actor-network-theory researchers call an asymmetric approach – to begin with. My argument is that Danish e-learning research has (mostly) been invested in imaginaries of the connectedness of everyday living with ICTs that are associated with the (social) constructivist movement. Consequently, (much) Danish e-learning research can be described as asymmetrical in several senses, for example:

- In a priori foregrounding particular educational forms and instructional practices,
- In a priori down valuing research into so-called ‘just-plain’ schools and traditional teaching activities,
- In a priori emphasizing the new (which is described as many things), while a priori ignoring the old (which is depicted mostly based on assumptions).

Elgaard Jensen (2007) illustrates an example of how hyping the new, i.e. open office, becomes enacted through the persuasive means of contrasting the new and the old. However, as Elgaard Jensen shows, it is mainly a particular imaginary about the future which is enacted. It exists virtually in the talk, but it is not necessarily realized in everyday ongoing practices. It may be a particular construction that in practice does not have much to do with what is actually going on.

**Hyping e-learning, ICTs and their agencies**

The constructivist hype surrounding ICTs in education (see, for instance, the Danish Ministry of Education, 1999) has taken off, especially in the last two decades in Denmark – accelerating since the early 1990s when the Danish government passed into
law the integrated use of ICTs in primary and secondary school teaching (though not in vocational education).

As several authors (e.g. Cuban, 2001; Mathiasen, 2002; Hine, 2000; Watts, 2007) note, several variations of technology enthusiasm and ‘hyping’ imaginaries\(^{198}\) exist and waves of technology enthusiasm can be identified. These include convincing circulations of expectations, prospects, and promises about progress associated with new technologies such as television, computers, the Internet, the speed of Internet connections, different generations of mobile telephony, etc. The technologies and conceptualizations of the ICTs we engage with are continuously on the move. An example of this in recent years is the growing focus on Web 2.0 technologies, a concept which can be traced back to 2005 to Tim O’Reilly, who according to his on-line biography, wishes to be: “… a catalyst for technology change by capturing and transmitting the knowledge of ‘alpha geeks’ and other innovators”.\(^{199}\)

Michael Platt (2007) wrote a paper on the technical developments and practical implications of Web 2.0 technologies, as well as the prospects related to another recent term coined by MacAfee of the Harvard Business School (2006), Enterprise 2.0 or Web 2.0 in the Enterprise. According to Platt, we are looking at a ten-year revolution in the sense that ten years ago Web 2.0 technologies simply did not exist (meaning there were no Web-sharing sites or applications). This is also the case with the term e-learning; Web 2.0 does not mark the beginning but can instead be viewed as a way of gathering this so-called revolution – through the imaginary that we are now moving away from Web 1.0 towards engagements with Web 2.0 technologies. Many descriptions of movements today, i.e. from Web 1.0 to 2.0 technologies, Enterprise 1.0 to Enterprises 2.0, and E-learning 1.0 to 2.0,\(^{200}\) as well as Mode 1 to Mode 2 research, involve dichotomist and contrasting imaginaries that seem to be connected with (social) constructivist movements and modern imaginaries of moving from the old to the new.

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\(^{198}\) One such imaginary relating to seamless computing, pervasive technologies and ambient technologies was presented in the forecast of technological developments made by the Danish Ministry of Science, Technology and Innovation (2003a). The authors argued that Denmark was entering what the authors termed the third IT-wave or generation, characterized by pervasive computing – meaning that ICT will be embedded in, wearable and always on. Hence, the digital constraints experienced ‘today’ – it was argued – will most likely disappear within the next decade, and new technological options will bring about new ways of learning, teaching and organizing education. Recent hyping imaginaries and new waves include Web 3D, Web 2.0 and E-learning 2.0.


\(^{200}\) The term E-learning 2.0 is also increasingly being used within the last couple of years. A Google search on “E-learning 2.0” has 119,000,000 hits. A “Web 2.0” search has 428,000,000 hits. A search on “Web 3.0” generates 190,000,000 hits. Numerous hits also appear for Web 4.0, 5.0, 6.0, 7.0, 8.0 and 9.0. (December 3, 2009).
E-learning has become a concept which manages to cover just about anything related to computers and the Internet in education (Bang, 2003). ICT (in the singular) is commonly depicted as enabling in the use of phrases like “ICT enable”, “ICT provides”, “ICT elevates”, “ICT impacts”, “ICT affects”, “ICT mediates”, etc. ICT is often described as a catalyst for change. Many critical researchers question the extent to which the changes we see are a matter of technologies or the ways we organize things in which ICTs are involved (e.g. Mathiasen, 2002; Bryderup et al., 2002; Fuglsang, E., 2003). Fuglsang, E. (2003), Brinkkjær (2002) and Krejsler (2002) argue that the so-called constructivist paradigm (which Brinkkjær and Krejsler call the emerging paradigm) towards which educational activities are supposedly moving is neither a new invention nor the consequence of new technologies. Brinkkjær (2002) suggests that the argument might be new, but that the visions associated with the imagined paradigm shifts have their origins in the nineteenth century:

A view across different times’ expectations in relation to the school and learning revolutions which movies, radio, and television would surely provide, illustrates a relatively steady vision for school: That it becomes fully integrated in society, and in ways that are much more engaging, giving, and effective than the school which existed at the different times of history.”

(Brinkkjær, 2002, p. 97)

ICT integration in schools has been accompanied by high expectations, but we actually do not know much about what we are talking about when we use the abbreviation ICT and the e in e-learning may refer equally to electronic, extended and extremely bad and – as Heilesen and Bækkelund Jensen (2003) note – it may be referring to all of them at once: “Extending learning through the means of computer media for better or worse” (ibid.).

Researching the space-timings of ICTs

This chapter has engaged in a discussion of some of the coexisting and coevolving movements and understandings of movements which I see partially represented at HBC and partially represented in Danish e-learning research literature. Clearly, depicting engagements with ICTs in education as generally being matters of engaging in an instructional paradigm shift and movements of progression towards the Information Society does not fit very well with the everyday living associated with HBC that chapters 1-4 have engaged with. The engagement work associated with the Studynet does not fit the descriptions of engaging in either the constructivist or instructivist paradigm. The approaches to engagements with the Studynet in everyday living associated with HBC are neither learner/learning directed, monocultural or unidirectional. They are, however, not matters of engaging in the facilitation of three
learning spaces either. Rather, the movements and engagement work described so far are better described as partially existing, ontologically multiple, perpetually mobile and heterogeneously constituted. Engagement work could be associated with particular learning philosophical approaches to organizing teaching, but the engagement work involving the Studynet at HBC is generally defined by its enactment in proximate relationships with the different sociomaterial relationships that engage activities at HBC. Rather than a full commitment to a learning theoretical approach, which is imagined to be the center of attention for engagements with the Studynet and instructional practices, organizing teaching activities at HBC involves many different actors, partially coexisting (dis-engagements) and constitutive entanglements.

While Danish e-learning research tends to produce development in education as a matter of a particular general movement of progression towards something ‘other’ (to be reached outside what is traditional), at HBC many different variations of movements and progression coexist. This chapter suggests that engaging in understanding shifting movements and variations within is another methodological key to understanding the ways in which ICTs take part and become part of moving everyday living.

Before concluding this thesis, Chapter 6 engages in further illustrating the shifting ontologies of what it means to communicate, handle assignments and engage in projects at HBC with ICTs.
CHAPTER 6: SHIFTING ONTOLOGIES
COMMUNICATION, ASSIGNMENTS AND PROJECTS

Chapter 1 focused on passages between variations of arrangements of math teaching and how they partially include and excluded the Studynet as an actor, while Chapter 2 centered on passages between some introductions to the Studynet and concrete realizations of the Studynet in relation to the everyday living at HBC. Chapter 3 examined passages between the IT Pedagogical Driving License and everyday living with the Studynet, teachers’ personal homepages, class and subject websites on the Studynet, and assignments with(out) the Assignment and Assignment Delivery functionalities on the Studynet. These chapters dealt with the ways in which the Studynet became agentized inside certain relationships, while Chapter 4 discussed how the Studynet and HBC can be viewed as partially coexisting and coevolving.

Chapter 6 introduces more examples of various ways of engaging the Studynet in everyday communication, courses, assignments and project work associated with HG and HHX. This chapter presents some of the activities enacted at HBC that are not overly concerned with making particular functionalities work ‘as promised’ (e.g. a Discussion functionality must generally be able to handle discussions). The activities included here are marked by partially engaging the Studynet in ways that primarily make sense in relation to variations of everyday living. Instead of focusing on general labels, functions, and full engagements, these activities approach the Studynet as a possible partial association, and this takes part in enacting different spaces for activities to unfold.

Chapter 6 illustrates how shifting space-timings for engagements with the Studynet as well as engagements with ways to handle communication and assignments produce different boundaries for what handling discussions and assignments with the Studynet is comprised of, what these matters partially contain as well as how they are partially contained by everyday ways of living at HBC.

While chapters 3 and 4 have been mainly occupied with variations of efforts to make ‘it’ (e.g. the Assignment and Assignment Delivery functionalities, the Discussion functionality, the class and subject sites) work, Chapter 6 engages variations of efforts to rework the ontological composition of what discussions and assignments may entail.

Chapter 5 engaged in a discussion of some of the coexisting and coevolving movements and understandings of movements that are partially represented at HBC and in e-learning research literature. This chapter concludes by suggesting that another
methodological key to understanding the ways in which the Studynet takes part and becomes part of moving everyday living may be to engage in understanding shifting movements and variations within. The stories told in this chapter illustrate how the shifting movements of the ontological compositions of communication and assignments take part in enacting both of them in multiple ways as variations within.

In Chapter 6 we encounter Vivian, the head of HG, again. She is considering making a move from the communication associated with Outlook and the Knowledge Sharing folder in the Studynet to also including evaluations and group discussions on the Studynet. The example with Vivian illustrates a passage between present instruments and methods becoming inadequate and new emerging possibilities for engaging in ways to communicate with the teachers. This chapter also engages with a story about Virtual Discussion as an odd event initiated by me in relation to the E-learning Group. We meet Ken, an HG teacher who engages in mixed teaching and discussions for a simulation course, John, who engages in project and course related discussions, and Roger, who engages in role play and course related discussions. Each example illustrates different ontological compositions of what engaging the Studynet means in the everyday ways of organizing communication associated with HBC.

I engage with this assemblage of many different snap-shot stories (Mol, 2002) to emphasize that many different partially coexisting and ontologically multiple relationships are at play and become entangled with the shifting constitutive entanglements of the Studynet as an actor in the everyday living associated with HBC. Only a few of these have been engaged in this thesis.

First story: Shifting ways to assemble

Vivian is the head of approximately twenty HG teachers. IT – as she describes it – plays an increasingly larger role since she was hired as the head of HG at HBC four years ago. As already mentioned in Chapter 3, Vivian highlights that the increasing emphasis on communication using IT necessitates the need to further explore and develop possibilities for how and through which instruments variations of forms of communication can best be handled:

Vivian: I believe that I am getting to a point where I could use some more options….
Mikala: Are you thinking in terms of the Studynet?
Vivian: I can’t give you an answer because I use Outlook a lot when I communicate with the teachers, but needs exist that are currently not being met. Of course we also meet face to face – and we need to. We typically plan teaching council meetings on days when the teachers work from home. The teachers want to call it a pedagogical
meeting. We could just as well call it a department meeting. I write an agenda with the team co-ordinators. I bring something to the agenda and then we spend half of the time on this, and the other half on team meetings. We need to engage in clarifying discussions about how to approach the school year, how we handle the structure, etc. But we almost don’t have enough time for those discussions, because we always have to deal with new initiatives. Something always comes from the higher ups that requires adjustments. We can’t just send an e-mail to the teachers that says: “By the way, there’s a teachers’ meeting on Friday at two o’clock” … That is not how the piper plays. People have to plan.\textsuperscript{201}

In HG the leaders and teachers have established practices for how to assemble in order to discuss more general matters relating to, for example, new educational reforms or specific matters related to each of the teacher teams. However, according to Vivian, the HG educational system – which she has been engaged with for twenty years – has been one long continuous reform movement.\textsuperscript{202} At the moment, the leaders are continuously receiving new materials about the HG reform, and as a new school year is about to commence, they must continuously make sure that the teachers are up to speed with the new decisions that influence their teaching plans. One example is the current restructuring of levels, which also implies a need to restructure the different options for making up schedules to ensure that the educational activities each student engages with meet the necessary requirements. These kinds of changes are fundamental to the teachers’ schedules as well. There are different ways to engage in the structural changes, and therefore, as Vivian explains, engaging in dialog with the teachers about their preferences is important. This is a challenge, however, when they are not able to meet with the teachers face to face to discuss these important issues. This is especially true at the time of year when exams are on and some of the teachers work as examiners in other parts of Denmark. E-mail dialogs, which have been the central means for leaders to communicate with teachers so far, are becoming insufficient with an increased demand for assembling teachers for important discussions that they cannot engage with face to face. In relationship to this everyday challenge, Vivian imagines that possibly the new options for handling discussions on the Studynet will become relevant. She sees the option of constructing an HG site on the Studynet where the teachers can engage in team related discussions and collective discussions about HG as a possible way of overcoming existing current limitations in their meeting practices.

\textsuperscript{201} Unless otherwise noted, this and the following quotes are from a recorded conversation with Vivian conducted by Hansbøl on June 8, 2005. During this conversation Vivian told me about relationships between ICT, HG and the Studynet. This conversation was followed by another conversation initiated by Vivian, who asked me to introduce her to the Studynet and its possibilities and relevance for (her) possible engagements in HG.

\textsuperscript{202} Recorded conversation with Vivian conducted by Hansbøl on July 26, 2005.
Vivian: … All in all, having different possibilities for discussing subject related challenges with the relevant people. But also having the opportunity to engage in broader discussions in the teacher group, because this involves the entire group … Mikala: … How well do you understand the Studynet?

Vivian: I don’t understand it at all. But I see a need to do so, because there is simply not enough. We can’t meet. There’s no room for this. We have to make use of the existing opportunities. To try to figure out when it makes sense.

Mikala: When to put things in the knowledge sharing folder, and when to send an e-mail?

Vivian: Exactly, because as I was going to say, you have to help me understand when it makes sense to send an e-mail and when something else is better? … I send huge amounts of e-mails. I put pressure on people to do things …

As in the case with my visit to the Frederikssund department to interview Andrew, this conversation surprised me. In both cases, remarkably specific relationships appear to matter concerning the ways in which engagements with the Studynet become established, yet none of them have been articulated at E-learning Group meetings. Although these meetings gathered representatives – though not students and administrative employees – from many different activities associated with HBC, they do not appear to have produced a space for the inclusion of the manifold coexisting heterogeneous relationships at stake in the everyday living at HBC. One aspect that was especially odd to me (at the time) about the conversation with Vivian, is the fact that she – one year into the introduction of the Studynet to the everyday living at HBC – still claims not to understand the Studynet at all. Even though students and teachers say that they do not fully understand the Studynet and the options for engaging with the Studynet, it seems particularly odd that even after having been engaged with the E-learning Group for the entire 2004-2005 school year, Vivian – the head of HG – still says she does not understand it at all.

Sarah is the only teacher who clearly expresses her concern about the big jump from the introduction to technical functionalities to the realization of the Studynet in the pedagogical relationships to be handled in her everyday teaching activities. The pedagogical relationships and organizational relationships are specifically related to different engagements with the everyday living associated with HBC, and these variations appear as an important presence in each human actor’s descriptions, but their presence is not necessarily given room in the collaborative spaces enacted at HBC. Inside these entanglements it is not so surprising after all that the constitutive entanglements of Vivian, Sarah and Andrew’s engagements with the Studynet do not become mobilized in my research before I engage in conversations and other ways of engaging with the human actors and their associations with HBC.
During our conversation Vivian asks me if I know whether any of the HG teachers use the Discussion functionality in the Studynet to communicate. I do not know of anyone. Like Vivian, however, I am also familiar with variations of ways to engage Outlook’s e-mail in course related communication between teachers and students.

Vivian: The leader ought to be in the front. And if I was smart then I would make a strategy. I ought to do that, really. Where are we headed with this pedagogically? How do we incorporate it into our subject and annual calendar? I really ought to do that. I have just earmarked ten hours for Sarah and Ken to participate in the E-learning Group. Then I have the reform development pool, which is fifty hours and covers a broad array of activities. Then I have the staff development interviews during which I ask about pedagogy, students, supervision, IT and the Studynet. This way we get a sense of what we are working with along the way, and they too get at sense of what we are working with. It is also a part of the school’s annual calendar … this is also a management tool. It is a part of working with quality. Then we have something concrete to check up on. This relates to the multi-year funding where we commit to documenting the work quality several times a year. You can do this, for example, by making an annual school calendar focusing on areas of particular interest. For instance, I’ve chosen IT competencies, the Studynet and EPIT as areas of concern. I’ve written that every teacher uses the Studynet during the school year and that every teacher has started EPIT …. Maybe I ought to focus on teaching and organizational areas of concern? … HG hardly has any rules about ICT integration.

In the previous chapters, the Studynet has primarily been enacted as an actor in the so-called pedagogical areas of concern mentioned by Vivian. While these areas are of course important to Vivian, being a school leader means engaging differently in the everyday ways of living at HBC. When it comes to concrete engagements with ICTs, Vivian is mostly concerned with organizational areas such as establishing spaces for teachers and leaders to share information, communicate and collaborate. The interviews with Sarah, Peter and Andrew and the conversations with Vivian, for example, demonstrate that each of them struggle with different everyday challenges and with finding ways to relate the Studynet to them in particularly meaningful ways. The organizational aspects of integrating the Studynet into everyday living at HBC mentioned by Vivian have not been the focus of initiatives like the introduction to the Studynet, Studynet workshops, E-learning Group meetings or the E-learning Day.

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203 There is a rule covering levels, which means that IT class must be at a C-level. Other than that, there are no requirements. IT integration, however, does not require permission either. If you want to use IT to support teaching differentiation, then you just do it. According to a EUD consultant from the Danish Ministry of Education, most education programs use IT for teaching differentiation. IT is also being used in relation to the Student Plan, registering absences and the assessment of real competencies. The Danish Ministry of Education requires that the curriculum and teaching plans are available on-line. According to the consultant no comprehensive views of IT integration in EUD existed at the time. (Source: Telephone conversation with UVM consultant about EUD on October 1, 2007.)

204 Teachers were allotted three hours to participate in this event.
In the preassembled structures of the Studynet each teacher team has its own site on the Studynet for sharing teaching materials, but other than that, Vivian highlights an area of concern that has not been in focus at HBC.

On July 26, 2005 our conversation about the Studynet continues at a second meeting set up partially because Vivian asked me to present the Studynet to her. She explains that at teacher meetings she would like to be able to illustrate ways to integrate the Studynet into their everyday organization of things. She thinks that as a leader it is important for her to actually set an example. She is unclear, however, as to where she can get technical and teaching support for engaging in these activities. In principle she can address her concerns to John and the IT support staff, but it is highly questionable whether she would in fact get the support she needs, because of the limited human resources available.206

Vivian: [Comment in relation to my presentation of the Studynet] Does that mean that whether you are a leader or a teacher that starting your morning by logging onto the Studynet as the channel for engaging in the different facilities would be desirable? Because I just open my Outlook, I log onto Citrix, and then I open my Outlook. Then I minimize it and open Word.207

Vivian’s comment is an illustration of the many concrete practicalities at stake when engaging with the Studynet in everyday living. As already illustrated in relation to the interviews with, for example, Sarah, Peter, and Andrew, these are important for understanding the ways in which the Studynet becomes part of (or does not become part of), and takes part in moving (or not moving), the everyday living associated with HBC. Generally, we know too little about the ways in which people, in practice, engage with variations of ICTs in everyday living. The question of whether Vivian should start up her morning by logging onto the Studynet and, for example, engage with Outlook illustrates that Vivian’s understanding of what defines her options for engagements with the Studynet has not yet been established. If she were in fact to start up with the

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205 Participating in workshops was voluntary.
206 In fact Vivian highlights a problem that may exist at more than just HBC. Ramböll Management’s (2007) report on knowledge sharing systems in Danish primary schools (Videndeling i den danske folkeskole: pædagogisk og organisatorisk anvendelse af videnlingssystemer) focuses on both pedagogical and organizational areas of use. Organizational use, however, is defined as: The distribution of information to teachers, parents and pupils; communication and teamwork among teachers; and the gathering of materials. Everyday communication and collaboration between leaders and teachers is not mentioned. Interestingly, the primary schools participating in the survey highlight the organizational aspects of using knowledge sharing systems as being the most important for schools. Pedagogical use is defined as: Communication and collaboration between teachers and pupils as well as between pupils and school-home collaboration, teaching differentiation and evaluation. The systematic, consistent and broad pedagogical use of the knowledge sharing system is only represented at the primary schools that have engaged with the system for at least two years (ibid., p. 7).
207 Recorded conversation with Vivian conducted by Hansbøl on July 26, 2005. Citrix is a technology for handling data and programs with one server.
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Studynet and not open her Outlook in the morning, one central difference would be that on the Studynet, she would only have web access to her e-mail engagements. This implies that she will not receive pop-up messages about new e-mails, and she will not have access to the full functionalities for maneuvering her e-mails. If she were to start up by opening the Studynet and Outlook, however, she would become engaged differently with the Studynet and its possible agencies.

As discussed in Chapter 4, each human actor associated with HBC is initially given a specific type of access to the Studynet, partially depending on their assumed role in the organization. The overall introductions to the Studynet for teachers (three hours) and students (one hour) were different, and the student introduction did not explicitly include engagements with these differences and particularities. As student, teacher and leader engagements in the everyday living associated with HBC involves different relationships and this means that their engagements with the Studynet will vary too, e.g. teachers – as shown by the example with Sarah in Chapter 3 – need to structure and communicate about instructional activities, handle assignments, communicate with students about the assignments, receive and correct assignments, administrate assignments and provide feedback on assignments. Students need to do assignments, communicate with teachers and other students about assignments and hand in assignments. As a leader, Vivian needs to communicate many things in different ways to teachers and students. This means that teachers, students and leaders become differently engaged with what are apparently same functionalities, for instance, the Assignment and Assignment Delivery functionalities on the Studynet. Vivian, for example, does not engage with these functionalities at all, because she is not involved in instructional activities. The functionalities, however, are not represented in the same

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208 The teacher introductions had already been held when I started engaging with HBC, and it never occurred to me during the empirical gatherings to ask Joelle more specifically about how she set up the teacher and student introductions. Joelle apparently did not see this as a topic of particular concern either. After my observation of her introduction to the students to the Studynet, she also did not mention that there were any differences between the two introductions. I gather that there must have been differences as the introduction for students – as I later found out – only lasted an hour while the one for teachers lasted three. During the empirical gatherings these variations of introductions to the Studynet did not strike me as something to go further into detail about, which is why I do not know much about the ways in which the leaders were formally introduced to the Studynet either. This is partially associated with the movements of my engagements in this research, too. To begin with, I was mainly concerned with student engagements. I imagined that I was researching computer supported distributed collaborative learning scenarios. Consequently, a good deal of the empirical gatherings that have now become central matters, had a different status in the research to begin with, e.g. as providing part of the context for what I was really interested in, or as a way of finding entrances to engaging and getting in contact with students and the collaborative activities associated with the Studynet. It turns out that much of what – e.g. the E-learning Group and the progress meetings – I acknowledged to begin with as merely points of entrance and stepping stones to ‘real’ matters would become very much part of what constituted my entanglements with HBC as well as that of this research. The movement of my engagements, and thus also the movement of things, is another important matter to take into consideration when engaging with the results of this research.
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way to students and teachers. When logged onto the Studynet, shifting from one identity to another within the system is not possible. This means teachers may only see what students see in class when they engage, e.g. with the Assignment and Assignment Delivery functionalities. Vivian cannot see what the teachers see either and must engage in their everyday living. Some teachers (e.g. Peter) also indicate that not being able to do so is frustrating because seeing and engaging with or communicating about problems is made more difficult.

Returning to Strathern’s point about difference in relationships rather than knowledge – mentioned in Vignette 2 and illustrated with the example of the scientists and aboriginals – the aspects that make it particularly difficult to engage in understanding the ways in which the Studynet becomes part of and takes part in moving everyday living associated with HBC is the shift in relationships that is also represented but not necessarily facilitated by the Studynet. Students, teachers, and leaders may have different knowledge about the Studynet, and they are quite practically differently related to the Studynet as well.

As illustrated in Chapter 3, translating things (e.g. assignments) through processes of associating them with the Studynet alters what may partially contain things, and thus also what those things may partially contain. Things such as discussions are not tangible objects. This is why making a general statement about what the effects of shifting forms of communication from e.g. e-mail to involving an HG site and the Discussion functionalities is not a simple task. The example with Vivian illustrates how working with ICTs in the everyday ways of organizing things brings increased emphasis on communication practices with ICTs. This in turn brings with it a need to continuously further develop the everyday ways of handling communication with or without ICTs. The conversations with Vivian also illustrate that shifting ways to assemble what it means to communicate and engage with the Studynet are related to the human actors and the ways they become related to the Studynet as leaders, teachers, and students. Vivian enacted the first example in this chapter as one that is concerned with how the Studynet could be associated with communication in the organization. The following examples will discuss shifting ways to assemble what it means to engage with assignments, communication, and the Studynet related to teaching activities. Each example presents a different version of doing communication/discussions, assignments, and the Studynet and their possible relationships.

Second story: ‘Virtual’ discussion

As part of my engagements in the E-learning Group’s second meeting, I set up a debate about e-learning and the Studynet using the Discussion functionalities on the E-learning
Group site. Next, the nineteen E-learning Group members were divided into groups, each consisting of a mix of people with different engagements within the organization (e.g. leader, HG teacher, HHX teacher, IT support), representing different educational programs (HG, HHX and KVU) as well as geographical locations (Trollesminde Allé, Carlsbergvej and Frederikssund).

At the first meeting in the E-learning Group I was asked to do an inspirational presentation (at the next meeting) that would encourage thoughts and discussions on the topics of e-learning and the Studynet. I decided that a presentation like this would be interesting if I prepared by doing an illustrative experiment between the first and the second meeting of the E-learning Group. Through practical experience with ways to organize group discussions using the Discussion functionality on the Studynet, I planned to engage the E-learning Group in their further work on e-learning and finding ways to entangle the Studynet with the everyday ways of living at HBC. The entire situation was a somewhat artificial setup partly designed to stimulate thoughts, illustrate challenges and exemplify the possibilities of this kind of activity. The setup was intentionally partial and imperfect. It was supposed to illustrate some of the new relationships, engagements and challenges these kinds of activities might involve. I assigned the E-learning Group members the role of being students and I stepped in to take on the role of the teacher, facilitating, arranging and designing the event.
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Arranging, designing and putting a ‘virtual’ discussion together like the one I initiated for the E-learning Group takes a good deal of effort. Since this was the first time the other E-learning Group members and I were engaging in these kinds of discussions involving the Studynet, we spent time getting to know the functionalities. But more importantly, the event also became part of getting a sense of their different ways of functioning inside concrete sociomaterial relationships. The preparation and initiation of the event required many different maneuvers, some of which may not be equally relevant every time one engages in this kind of activity (i.e. becoming familiar with the variations of possible views for discussion contributions, how to make a comment, starting a new discussion, a new thread in a discussion, etc.). However, discussions, their space-timings and agencies and – in relation to these – the maneuvers that may make sense in relation to particular discussions are aspects that need to be continuously reworked and developed.

A ‘virtual’ discussion does not just exist as a specific form to be applied in classrooms/schools with a generally positive effect. First of all, ‘virtual’ discussions are not just virtual! They are very real material components of different activities in everyday living. During the so-called virtual discussion in the E-learning Group we used the so-called threaded Discussion functionalities on the E-learning Group site. I started by preparing the framing of the discussions, which was of course already partially set up through its entanglements with the E-learning Group and the E-learning Group’s site on the Studynet:

- Info e-mail about expected duration/time of the virtual discussion, September 9-22, 2004 (Source: e-mail September 6, 2004)
As a new way of framing discussions, numerous details needed to be explained, considered and evaluated. Participants had to be guided to understand the where, when, who, what and how of the exercise. The space-timings and agentizations of the discussions were different from, e.g. a face-to-face discussions happening within the framework of an E-learning Group meeting. For one thing, the virtual discussion was set up to last fourteen days. When he asked me how to solve the assignment, Peter commented that it was a long assignment. Compared to the practices at HBC, Peter was right. It was a long assignment. I did not yet understand and knew little about the everyday living related to HBC. I had related my setup of the discussion to my teaching experiences with virtual discussions for mix-mode master’s programs with an emphasis on virtual project pedagogy as the learning strategy, and CSCL as the theoretical inspiration for engaging in these activities. When I heard Peter’s comment it occurred to me that inside the relationships associated with HBC, I had designed an odd event, which did not necessarily illustrate the entanglements to be handled in everyday living relating to HBC. This however, was not necessarily a bad thing. As it turned out, this odd event would become an analogy to partially move from. It became an event that partially opened up and at the same time emphasized the original problem: Engaging with virtual discussions and creating (good) passages between the Discussion functionalities and activities at HBC is not a simple matter.

First of all, the different E-learning Group members engaged differently with the discussion. One HG teacher became frustrated when beginning the activity because the HG teachers (it turned out) had not received the same amounts of hours for engaging in the E-learning Group as the HHX teachers. Other teachers did not actively contribute to the discussions but said that they had been following the discussions and quite a few of

209 Source: Conversation with Peter when observing ITB on September 8, 2004.
them mentioned that they talked about the discussion in the hall at school. As both an HHX teacher and the head of quality and communication, John posted a comment stating that he was really inspired by and excited about these discussions. He could not remember when they had ever engaged qualitatively in pedagogical discussions like this during meetings at school. The contributions to the discussions on the E-learning Group site do not indicate directly whether the virtual discussion was a success or not. Either way it was probably neither a complete success nor a complete failure. It did, however, become an event that some teachers referred to in the further development of their teaching activities that included the Studynet.

The virtual discussion can be viewed as an example of how a group of teachers would experience it differently if the HG leader were to (without adding resources for participation) engage virtual discussions as everyday communication practices in the organization that require participation. There is one important concern that shines through Peter’s comment that I had not considered when arranging the activity: Time. The space-timings of communication and meeting practices associated with HBC are at the moment different from the space-timings contained in my setup of the discussion. There is a difference between meeting face to face at school at a dedicated (also in terms of resources) time every other month and spreading a meeting out over fourteen days on an HG site. This difference in the space-timings of events involves many shifts in the constitutive entanglements of this kind of meeting. One example of this kind of shift is the possibility of moving and interacting ‘around’ the meeting while it is still ongoing without actually ‘being at’ the meeting. These shifts do not necessarily suit the momentary everyday ways of living at HBC. Therefore, it would require variations of translations to move ‘from’ experiences with the Virtual Discussion to arrangements of discussions in relation to teaching activities at HBC. And perhaps more importantly, appearing as a rather odd construction, the relevance of this event and these kinds of activities became in danger of being prepositioned as irrelevant. Some reworking was required to engage with my setup as a source of inspiration for further engagements with the Studynet in relation to other everyday living associated with HBC. In the following I trace some activities that appeared to be partially related to the virtual discussion. These activities clearly show that partial connections involving numerous translations are made in order to engage the discussion functionalities as actors in variations of instructional activities.

Third story: Variations of discussions

When ‘shadowing’ the activities on the Studynet on October 27, 2004, I realized that the HHX history teacher, Roger, had enacted a different composition of engaging virtual discussions in his teaching activities for HHX:
Based on the various materials Roger made available on-line for students, I could tell that he was partially inspired by my setup of the virtual discussion for the E-learning Group. This was concretely represented when he used my manual for the discussion functionalities, and also in his instructions to the students on how to contribute to the discussions. Roger’s setup, however, was also very different from mine, and maybe also partially inspired by John’s setup of subject related discussions for his HHX3 contemporary history class:

John described his experiences with these discussions in one of his comments about the Virtual Discussion for the E-learning Group with the subject headline: “My first real e-learning experience was good”:

HHX3 contemporary history class. Homework: Each person contributes with a comment on the history page about this question: In your opinion, what are the greatest obstacles for peace in the Middle East?

210 September 13, 2004. I only have a print of the comment.
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See [link to the discussion]

This class does not do very well verbally. They do not engage much in discussions!

In this example the subject related discussion is really taking off. There were many qualified comments of a substantial length. They are not afraid to contribute ... And it also became extremely transparent to the teacher regarding who participated and who did not and with what contributions. Even the time is registered: Karen made a contribution at 00.21 AM.

Consequently, my question to the E-learning Group involves three things:

How do we sum up on a discussion like this in class? Should the comments just blow around in the wind on the Studynet until the teacher can be bothered to erase them? Because the learning HAS happened?

Maybe the students wonder about what’s visible in order to make an impression on the teacher? Do we care about that? (We are also making what we do visible here, so that Mikala can see whether we have done our homework!)

The e-learning provides great value for asynchronous events. Maybe Karen works better after midnight? Or maybe the transparency takes part in making us feel stressed out/tired? Because we cannot hide/take a nap during class? How do we learn to tackle the art of limitation?

John’s comments raise many important concerns to be dealt with when engaging threaded discussions as a means for communication for teaching activities. The spacetimings of student actions are altered, and this simultaneously opens up new concerns while shedding new light on ‘old’ concerns. John’s approach to engaging with what he calls subject related discussions differs from my way of engaging the Studynet Discussion functionalities. First, John limits the student contributions to one entry per student. In both cases, the discussions represent attempts to enact passages to open up and engage in discussions about particular issues. John relates the discussion to the already existing teaching practices at school while simultaneously altering them. Conventionally, course related discussions take place in school. You would conventionally not assign a verbal discussion as homework, but John can assign a written discussion as homework and preparation for the next meeting in class. In this sense, what contains discussions, homework and meeting in class as well as their relationships is altered. John writes that this change in relationships – and thus also student options for engagements with the discussions – is expressed, for example, in the fact that in a class where getting discussions started is usually difficult, the written discussions seem to really take off. Inside these relationships it seems that virtual discussions become enacted as passages to move from under articulated to very articulated engagements in course related discussions. However, as the version of virtual discussion enacted here is very different from the one enacted in relationships...
with the E-learning Group, John cannot simply transfer his experiences and understanding of the mechanisms of virtual discussions from one situation to the other. Each situation and version enacts different relationships.

A third variation was enacted by Roger’s translation, which is quite different from both John’s and mine. He mixes role play and course related discussions into what he calls net discussions. Roger’s variation of net discussions is part of an activity that requires a presentation and discussions in class:

![Screenshot of Roger’s role play and net discussions for his HHX3 contemporary history class.](image)

The following excerpt is from Roger’s introduction to the activities:

> The aim of this role play is for you to ignore your ‘ethnocentrism’ – and primarily put yourselves in the roles that you are given. The goal of your assignment is to try to convince your opponent using every possible argument.

The two opponents are of course:

- Jews vs. Palestinians
- Muslims vs. Danes

But there are of course many more parts!!! Within the four groups some of you will receive more specific roles (i.e. 1-2 Jews will be settlers … 1-2 Muslims will be fundamentalists … 1-2 Danes will be racists … 1-2 Palestinians will be terrorists.)

... I have not tried this before, so let’s see how it goes.

Roger.²¹¹

The following is also part of Roger’s framework:

²¹¹ Introduction to the discussion accessed on the Studynet on October 27, 2004.
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- Concrete suggestions for arguments to engage with in relation to each of the four groups
- Suggestions for the central concepts each groups could engage with
- Concrete guidelines for how to participate in and contribute to – what Roger also calls – the digital discussion
- Manual for handling discussions

Roger’s variation of the discussion is arranged in school and fit within the already existing space-timings of face-to-face lessons at school. One could say that while my version referred to a mix-mode master’s program practices, John and Roger’s translations connect with the everyday school structures. What refers to discussions and what they refer to is changed in each version, but in the teachers’ versions they match the constitutive entanglements of everyday living associated with HBC better. I see this as a central point.

**Summation**

I use the conversation with Vivian and the different examples of what I see as variations of enactments of discussions to illustrate the points that:

- discussions are many things
- partially contain discussions as virtual in the form of relating them to the Discussion functionalities on the Studynet includes many possible variations and processes of translations
- Each version of a discussion may be viewed as partially existing solution that bring about options as well as challenges.

As discussed in the beginning of this thesis in the chapter called Connecting, what is also referred to as “conferences” in Danish e-learning research is many times presented as carrying certain qualities for communication. The above examples, however, illustrate that Discussion functionalities may be enacted in many ways, not all of which make an equal amount of sense for everyone, everywhere at anytime. They also illustrate an issue which I believe is central to understanding teachers and their instructional activities: teaching is a particular matter. What works in class depends on the class, the teacher and many other factors. Another important point is that an enactment of what may appear (inside certain entanglements) as an odd example does not necessarily render it entirely irrelevant – or odd, for that matter. Instead, it may be that it can function as an analogy for other circumstances and thus become a partial

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212 I do not know the concrete details of the setup that I only became aware of when shadowing the Studynet. I did not have the opportunity to ask the teacher about the event.
reference for engagements. Whether this is productive or not is to be understood as a relational and complex matter. And sometimes, as the teachers’ movements from their personal homepages to the Studynet homepages, for example, show, it may not be a question of productivity, because this is a particular movement that is required for practical reasons such as homepage servers being closed down.

There is a central difference between the translations needed in Vivian, John and Roger’s case. Roger and John have the students gathered in one place, which means they more or less have easy access on a daily basis to adjust the instructional design, and instruct, guide and persuade students into using a particular functionality on the Studynet. Vivian, on the other hand, does not have the same access to gathering, guiding and persuading the teachers. That is part of her problem. She is dealing with a differently gathered as well as distributed group of people. While Roger and John can gather students around computers in school and thus guide them through the technicalities, Vivian cannot as easily gather the teachers around computers to guide them through the technicalities. Roger and John can, in a sense, control the outcome of the discussion in class (e.g. by limiting student contributions), while Vivian, for example, cannot easily control how heated discussions in the teacher group will evolve.

There is also another concern. Sarah and Vivian express concern about whether virtual discussions are actually the right form of communication for HG students. According to them, big differences exist between the ways HG and HHX work with and emphasize written assignments and text-based communication. This is another reason why my setup of the virtual discussion in the E-learning Group does not (and should perhaps not) just easily translate into other kinds of settings at HBC.

The remainder of this chapter focuses on other enactments of ways to engage with course related discussions that involve, for example, e-mail and Messenger. The next examples, however, all have several ICTs in the instructional activities. The fourth story enacts another passage for engaging in these.

Fourth story: Towards the extended teaching palette

At the E-learning Day on August 25, 2005, Roger presented his approach to e-learning as mixed teaching. A consultant from the Danish Ministry of Education explained that mixed teaching in relation to four upper secondary school programs was intended by the Danish Ministry of Education as distance teaching combined with face-to-face teaching. The mixed teaching approach suggested by Roger is somewhat different as it does not insert a difference between teaching at a distance and teaching in proximity of

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213 Recorded meeting on September 19 2007.
one another, i.e. face to face. For Roger, mixed teaching is a matter of finding ways to engage ICTs in the various face-to-face activities. The following list presents some of the mixed teaching practices emphasized by Roger in his presentation:

**Mixed teaching examples:**
- On-line articles and questions to work with
- Information from links/pages and sometimes open searches
- Students make productions for repetition, e.g.
  - An introduction to the Cold War
  - Upload to the Studynet
  - Teacher follows up
- Source critique
  - Pages with attitudes
- ‘Opinionated sites’
  - Look for the hidden agenda
  - The Internet as the world’s greatest political platform
- Role play and net discussions
  - Subject related
- PowerPoint – images of history
  - Students find images and teacher follows up
- Group work in relation to links
  - Part of working on a theme
- Repetition
  - What have we learned?
  - The most important points
- Hot potato – entertaining way to revise and conclude theme

(Source: Roger’s PowerPoint presentation from the E-learning Day on August 25, 2005.)

In a comment on the virtual discussion in the E-learning Group Roger strongly rejects the idea that part of his teaching activities should physically take place at a distance from the students. He emphasizes that mixed teaching is a matter of making variations in the everyday organization of things. He has specialized in partially connecting ICTs in various ways with his everyday teaching activities and the students’ activities. Net discussions in his approach become another possible variation and way to organize things.

Each variation of the virtual discussion engages different challenges and opportunities for students and teachers, and each variation has its own space-timings and agencies. This is a central point, because when engaging in new ICTs, they often become the center of attention, and that was also the case of the Studynet in the E-learning Group.
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On several occasions E-learning Group members said that they did not see the Studynet as e-learning. The Studynet was just one of many ICTs at play in the ongoing reconfigurations of their everyday ways of living.

I started out in the E-learning Group with a ‘bad’ example of virtual discussions, but within the first six months the E-learning Group members started conceptualizing what they referred to as the extended teaching palette:

![The extended teaching palette](source: John’s presentation at conference on December 11, 2006.)

Using the image of a painter’s palette, they moved from initially working with Prind’s (1999) three spaces for learning as their learning strategy to the more broadly formulated educational strategy of engaging with the extended teaching palette. This was much more in line with their current practices as well as the direction they imagined future practices with ICTs at HBC would be taking. The analogy of the extended teaching palette is quite different than the ones usually referred to in e-learning research, namely net-supported or net-based teaching/learning. First of all, it does not assume that ICTs are involved. Second, it does not imply what the role of ICTs is. Third, and perhaps most importantly, the extended teaching palette does not infer with which actors are involved in the activities or what constitutes the what and whereabouts of the activities.

The final two examples to be included in this chapter (and thesis) are examples that illustrate how many teaching activities in the everyday ways of living associated with HBC may be better defined as mixed teaching activities. In these examples Ken and John arrange two more versions of what it means to enact ICTs as instruments for communication and assignment work.
Fifth story: VOF subject in development – combining the Studynet, e-mail and ordinary teaching

Ken, an HG teacher, presents the objectives of the IT tools class as an opportunity for HG students to choose and work with standard IT tools for a concrete task. Furthermore, the students can select, install and work with different operating systems. They can make a manual, transfer data between systems, use graphic user interfaces and work with a combination of different programs. The assignments are available on the Studynet, and after going through the VOF course with students in class, students must work individually (not necessarily situated in school) in a place where they have access to the Internet connection for the rest of the VOF. They can receive assistance, and instructional activities are offered in class as necessary. A VOF lasts fourteen days. During the VOF Ken e-mails urgent assignments for the students to solve. According to Ken, VOF is about creating a situation that is close to a real-life work situation as possible.

During the VOF, Outlook is used as a central means of communication when the students need to contact the teacher and vice versa. This is, for example, represented in the fact that Ken starts the day by writing an e-mail to all the students asking where they are on the different assignments and tasks as well as geographically.

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214 This was the title of Ken’s E-learning Day presentation. VOF (valgfrit områdefag) stands for elective area class.

215 Outlook is a central instrument in the arrangement of this course. The way in which students and teachers engage with Outlook, however, means that it is not central that they are connected to the Studynet. Consequently, using Outlook as a source of communication does not necessarily involve the Studynet.
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Screenshots of Outlook activities related to Ken’s VOF, January 2005. These screenshots and the one beneath illustrate that Outlook is being used to locate students, respond quickly to questions and identify problems.

Ken explains that during a VOF course like this, students and teachers are very busy. The students are engaged in short term tasks and long term assignments, and the teacher is busy communicating with the students, keeping an eye on how things progress, localizing students, making sure that everybody stays busy, sending out urgent assignments, receiving and correcting assignments, acting as a consultant when students need assistance, and providing class instruction.

This example of a way to engage ICTs in communication related to instructional activities and assignments is another illustration of the different ways to approach these engagements in HG and HHX. Teachers and leaders at HBC emphasize that there are large differences between HG and HHX programs. One of the central differences is that HG focuses on the concrete usage of numerous different ICT tools. HG’s central focus is educating service workers, while HHX’s task is focused on educating knowledge workers. Friesen (2008) problematizes the fact that e-learning research has put too much emphasis on the knowledge economy and the need to educate knowledge workers:

These top five industries hardly suggest that your best chances for a job would be to become a “mature knowledge producer” who would manage and produce knowledge or direct and meter knowledge flows. You would be more likely to conclude that future career choices can be found in the area of service: Working in a
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Wal-Mart (retail), a Holiday Inn (hospitality), or perhaps more optimistically as a hospital worker or care provider (healthcare).

(Friesen, 2008, p.8)

The result of such an overemphasis on the knowledge economy and Information Society is, according to Friesen, that it produces the effect that the situation is generalized as relating to a particular class or group. Throughout this thesis, I have discussed the problems of overemphasizing and naturalizing particular relationships and educational practices. When I set up the Virtual Discussion in the E-learning Group, I too produced an overemphasis of a particularly relevant way of engaging in ICT-supported discussions. By ignorantly mixing all kinds of human actors in each discussion group I further made the mistake of not being aware of and taking into account the heterogeneously constituted educational contexts associated with HBC. While it may make sense to engage in subject related net discussions in Roger and John’s classes, in Ken’s classes and in Vivian’s everyday living, it makes sense to engage differently. I established the groups for the virtual discussion in the E-learning Group with a mix of people that would not actually have much in common to discuss. This may be part of the reason why the discussions in each group never got started. As a result, a week into the discussions, I said that the contributors no longer had to stay within the frames of ‘their own group’. However, in spite of what seems to be great differences in engagements with ICTs, communication and assignments in HG and HHX, it still seems that translations can be made from one educational program to another. In fact, while visiting HBC I often thought that the boundaries established between the three kinds of educational programs contained at HBC might not be necessary. Especially if the point of departure is taken in translations rather than the transfer of activities from one context to another.

Sixth story: Messenger, Studynet, Word …

One example of how engagements with ICTs in HG can provide inspiration for HHX engagements is when the Live Communication Server was added to the Studynet in April 2005. John comes up with the idea of trying to involve instant messaging via Windows Messenger as an instrument for communication for his supervision of the project groups’ work during a project day (six lessons) in his contemporary history class.

Ken’s version did not enroll the Studynet as a central actor in the VOF activities and John’s version illustrates how the Studynet may become an increasingly central actor in the instructional activities at HBC as it becomes entangled with many aspects of the activities, i.e. the teacher structuration and communication of the activities, student access to different materials and information related to a course, teacher and student
communication, student work and presentations of their work, the teachers’ feedback on the work, and the final evaluation of a course. Whether this increased emphasis on the Studynet would translate into HG is not certain. John’s version relates to HHX’s particular ways of organizing teaching activities.

On April 25, 2005, John’s HHX3 history class had a project day. I shadowed John that day. In 2004-2005 (before the upper secondary school program reform) project work often took place on project days at HBC. One challenge John often experienced on project days was having to run around the school finding students either to assist the ones who needed help or to keep track of things. John said that this was highly annoying for both students (who would run around school looking for the teacher) and the teacher (who would run around school looking for the students). When Microsoft’s Live Communication Server was added to the Studynet it meant that Windows Messenger and instant messaging possibilities were associated with the Studynet and made available on campus at the Trollesminde Allé department where John taught. John subsequently decided to arrange a project day where he would sit in the classroom with his laptop computer with a wireless Internet connection, and then the students could work from anywhere on the school campus where access to a PC and the Studynet was possible. The students could seek supervision online or come to the classroom to talk face to face.

**Information about the teaching event**

In the lesson before the project day, the students watched a movie about globalization and two other lessons were spent looking at their assignments and the different materials distributed by John via the history course site on the Studynet.

John had written the instructions for the preparatory lesson and the project day on the class calendar on the Studynet. He also uploaded different documents for each group on the course site.

The class was divided into eight groups (based on student preference). Seven groups had three members and one had four. Twenty-five students participated all together. The three topics and sub-questions were: 1. Africa, 2. International collaboration and 3. Zimbabwe. The end product was a PowerPoint presentation the students were supposed to present for history class after the project day:

Seven adolescent boys and ten girls were present on the project day.
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Screenshots of materials uploaded to the Studynet by the teacher in relation to the Africa theme.

The descriptions include a combination of observation notes and screenshots from the event. I shadowed the teacher who had to handle Messenger as a means of ongoing communication with an entire class for the first time as the project day unfolded. As a result, the descriptions primarily follow the teacher’s movements. I include a detailed description of the teacher’s activity, because it best illustrates the many bifurcations and practicalities involved in a teaching event like this:

8:30 AM – John introduces the day and explains that the students need to engage with the questions and do a final PowerPoint presentation. By 14.30 PM every group must have handed in their presentation whether everyone is present in the group or not.

8:56 AM – The first question pops up (Charlotte).

John answers. I suggest that John save the chat.

John: Can we do that? How do you do that?

I tell him how to save the chat and I also ask him to make screenshots once in a while. These later became a resource for John to rely on in his presentation on this activity for other teachers and schools. They also became a resource for engaging in the descriptions of the specificities of the event in this chapter.

8:59 AM – Two students enter the classroom and ask John a question.

John: Why didn’t you use Messenger?

Students: Because we were right next door.

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216 “…” marks that I have cut out part of the description to shorten it down for the reader.
217 These later became a resource for John to rely on in his presentation on this activity for other teachers and schools. They also became a resource for engaging in the descriptions of the specificities of the event in this chapter.
9:03 AM – John shuts down Messenger and forgets to save.

9.03 AM – A new question – this time – from Christine pops up.

John: You can’t click return or it sends the message. In principle I could have twenty-four windows open. It’s important for the students to also remember to save their dialogs, so they don’t disappear.

Isn’t it possible to make a collective message on Messenger?

9:08 AM – Another message, this time from Carl … and then another.

John: Now they are coming in! They don’t understand what it means to problematize. Then you learn that too.

John: The red blinking makes you feel stressed.

Another question pops up from Lili.

9:13 AM – John checks his e-mail.

9:18 AM – A student arrives and asks how you say “trosretning” [religious denomination] in English?

9:20 AM – John prepares a PowerPoint presentation for a conference.

9.34 AM – A boy enters the classroom and asks John if he has time to look at a suggestion for a problematization.

John: Yes (finishing an e-mail).
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Another message pops up on Messenger.

John: I think it’s about time for me to become active.

John starts by contacting the groups he has not heard from. John looks at the class list and according to the Studynet they all look passive (they are red instead of green).

John: That just can’t be. Uh …

John realizes that he was disconnected and logs on again. Then he writes a “How’s it going?” message.

I ask him to take a screenshot.

John: Hey… one more. Claude, Claude, Claude … Where are you at? Looking at his paper where the groups have listed their work questions.

Question from Claude: What do I do if my group is not here?

Jan on Messenger: About the amount of slides for the presentation?

John: Why are some red and some blue?

Mikala: The blinking red ones are writing a message to you.

John makes a screenshot and concludes with a smile: Well, I have to move on …

John answers several questions. Eight Messenger windows are currently active.

9:47 AM – A girl enters the classroom
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Girl: John, can I please ask you a question? I didn’t want to write because it is a long question.

One of the boys is using a thumb’s up icon, which is not automatically in Messenger.

John: How did he make that?

John: Okay, so the question is whether I have to answer every time, because then we can go on and on with okay, thank you, okay, etc.

9:50 AM – A girl enters the classroom and asks a question.

John receives a couple of e-mails, laughs, and comments that things are really getting going. Then he answers an e-mail.

9:54 AM – John tells me that there is another group he has not heard from yet.

John writes the group: How’s it going in Zimbabwe?

A few seconds later he receives an answer: Don’t think they are doing very well, 25% of the civilians are HIV positive …

The next hour continues more or less in this way. Students either enter the classroom to ask questions or send questions to John on Messenger. At approximately 10:30 John decides to visit the groups. On his way round, he realizes that one of the groups (two girls) have never used Messenger before. He helps them get started and then returns to the classroom.

10:46 AM – Back in the classroom John says that he now has a comprehensive view of all the groups. Then he answers Jill, who is now on Messenger: Congratulations! Now you can use Messenger.

Jill and the two other girls in her group are now actively using Messenger: Should we use all of Lomborg’s points of view or …?

11:26 AM – Richard is writing a message and sends a file on Messenger

John: I thought we needed to use Outlook or the Studynet. I had forgotten that we could use Messenger. How difficult can it be?

John looks at the document and comments that he needs to save it.

11:37 AM – A boy enters the classroom and asks whether the slides is for a presentation.

11:38 AM – Eleven chat windows are now active.
John returns his comments to Richard’s group.

Except for lunch break between 12:00 and 12:30 the day continues more or less like this. A flow of students enter the classroom and send questions and materials for John to comment on via Messenger.

At approximately 13:00 PM John decides to evaluate the day by using the survey tool on the Studynet. At 13:14 PM the survey is available on the Studynet, and John sends a message to each group asking them to remember to fill it out before leaving.

The rest of the day is busy and at one point John has thirteen active chat windows. As the deadline approaches increasingly more students send their materials, ask questions, experience problems saving their work, etc.218

Screenshots of the documents and evaluations as they appear at the end. Overall, the evaluations were positive.

After reading the student evaluations responding to John’s question: What do you think of the supervision on Messenger?, this way of arranging a project day generally appears to have provided a better passage to communication between students and teacher than the conventional way of organizing supervision on project days. One group mentions that sometimes it is easier to communicate face to face, another one says that supervision this way made things clear, easy and understandable. One group comments that it was nice not having to run around the school looking for the teacher, which, in that sense, make it a time saver. Another group says that they thought the supervision was good and that it was nice to be able to get in contact with the teacher all the time. One group states that Messenger was easy to get acquainted with because it is similar to what they are already use at home. The last group furthermore points out that receiving

218 John says that it has to do with student rights, which is something he has asked NNIT to fix.
written supervision makes it possible to go back to what the teacher said, which is a good help for clarification. John also said that he was excited about how fairly simple and yet successful the setup was.

However, even though the setup appears simple, this was primarily because it functioned. One central aspect to keep in mind is that the passage enacted was a better variation in comparison to face-to-face supervision, where students must often run around the school looking for the teacher and vice versa. This comparison is a specificity. If John or some of the students had experienced trouble with handling communication on Messenger that day, the event may not have been enacted as providing a better passage.

Many moments of bifurcations appear throughout the course of the project day. Any one of them could easily break down and instead take part in mobilizing the event as a worse passage to supervision, for example:

- The teacher stays in the classroom, which means he is almost double present all day in the sense that students can turn to John both on-line and in class. And they can do this more or less at the same time.
- Messenger turns out to be a more or less intuitive instrument for the teacher and the students. My presence and knowledge about Messenger, however, also contribute to John’s options for engaging in handling Messenger.
- The event includes the option of students asking John questions face to face.
- John decides to pay each group a visit, which helps reveal that one of the groups had not actually begun working with Messenger yet.
- John stays calm throughout the day, even though he at times simultaneously has thirteen Messenger Windows demanding his attention.
- John is familiar with the Evaluation functionality on the Studynet, which is why it does not take him more than a few minutes to construct the on-line evaluation of the event.
- No technical breakdowns appear to have occurred during the day in the form of an unstable Internet connection, computers working too slowly, etc.

It is important not to take for granted that this setup and its agency are immediately transferrable and generalizable into other educational activities. One point of bifurcation could be if the teacher and students were differently familiar with Messenger. Another point of bifurcation could be if, for example, the students were to experience trouble getting access to computers, the Internet or the Studynet. Lack of access to the Studynet is a likely situation to occur in the everyday living associated with HBC\textsuperscript{219}.

\textsuperscript{219} The Appendix provides several descriptions of these kinds of situations.
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Shifting ontologies

The examples of ways to engage with ICTs as instruments for handling communication in the everyday activities at HBC mentioned in this chapter all depend on computers and Internet connections being available in the everyday living at school and/or at home. I have included different examples of ways to partially contain ICTs (including the Studynet), assignments/tasks and communication in the everyday ways of living associated with HBC. These examples all involve particular ways of making the Studynet work in particular arrangements and of reworking the everyday activities at HBC in relation to them.

As the examples of ways to make ICTs tools for communication in relation to different activities at HBC show, communication becomes differently engaged with the activities each and every time. Communication can become part of the everyday discussions between leaders and teachers and between members of a development group or e.g. a teacher team. Communication can also become part of subject related discussions in relation to history class. Discussions can involve different ICTs such as Discussion functionalities on the Studynet, Outlook e-mails, instant messages on Messenger, and combinations of different composites of ICTs. Net-supported discussions can become part of the ways students engage with the teacher and vice versa as well as the ways in which students engage with each other. Net-supported discussions can also become part of the way of approaching a subject as well as understanding an assignment. Just like the multiple other ways we engage every day with manifold ways of communicating face to face and at distance (e.g. with post-it notes), we can also engage in multiple ways of combining face to face and net-supported communication and activities.

At HBC, E-learning Group members describe mixed teaching activities by using the analogy of an extended teaching palette. Instead of thinking in terms of enacting movements back and forth from one (face to face) activity to another (virtual), at HBC movements are matters of shifting ontological compositions of things. Each mix represents moments of bifurcations that, depending on the paths and turns invoked, enacts (im-)possibilities and (dis-)connections.

Another central point is that any one activity does not involve the same engagements for the heterogeneous (human) actors involved. For example, while the people arranging an activity might perhaps need to learn how to facilitate, design and arrange an event, the other human actors must learn to engage in an event that has been partially framed by others. Also, depending on each individual’s relationship with the event as well as other events, people will most likely not engage in the same ways with activities.
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Summation

In the above I have attempted to illustrate that numerous shifting ontologies, moving engagements and events coexist, co-emerge and ‘find’ places at HBC, but I also show that they are not necessarily articulated and fully observable in the classroom or the Studynet. The different descriptions each illustrate snapshots of events that involve different entanglements in relation to the heterogeneous organizations of everyday living at HBC, none of them can be said to be generally relevant for all the human actors and activities at HBC. The descriptions included in this thesis illustrate, for the most part, *how ICTs become actors* in partially moving the everyday living relating to teachers, instructional activities, leaders, and educational programs.

There is no recipe defining what, how (much), when, and how ICTs should take part in the everyday living. As already illustrated this must be understood as *relative to the moving circumstances*. ICT integration is often accompanied by arguments that the introduction of ICTs in education will generally create new possibilities for student learning. Any of the previous descriptions in this chapter can be viewed as particular examples that do not necessarily relate to the general ways in which ICTs take part in everyday living with ICT, and not all students will become engaged, for example, in role play via the Studynet or Outlook communication in relation to the VOF course previously described. Furthermore, each instance may only occur once in a student’s study time. If we look at students’ everyday living with ICTs, the workings previously described only partially relate to students and not all workings engage the same students.

The point is that when presenting (as discussed in Chapter 5) some schools as standing still because ICTs are not generally revolutionizing educational programs in the ways imagined, we easily overlook the multiple ongoing (re-)workings and partial movements of the space-timings and agentizations related to working with ICTs in education. These movements may not *generally* influence the everyday living related to students, but understanding them is nonetheless central if we wish to *understand the ways in which ICTs become partial actors entangled with the ongoing movements in everyday ways of organizing and handling education*. Movements of the space-timings and agentizations related to ICTs involve the human actors in education in heterogeneous ways. This means that while teachers may spend hours working with ICTs in order to make some things work, students and school leaders may engage differently with ICTs.

In earlier chapters we saw that both Sarah and Peter put a good deal of effort into making the assignment module compatible with the everyday living in HG and HHX.
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activities involving assignments. These efforts, however, are not generally represented in the everyday lives related to students because they are generally handing in assignments on paper, via e-mail or by uploading them to document libraries on the Studynet. And these practices may be partial consequences of Sarah and Peter’s efforts rather than matters of a general lack of will to engage with the assignment module.

*Handling assignments* becomes a different event in the hands of students and teachers. While students need to work on assignments and hand them in to teachers, teachers need to plan, disseminate, organize students’ work and administrate the assignments. Thus, the assignment module does not partially contain teachers and students in the same way, and teacher and student activities do not partially contain the assignment module in the same ways. Furthermore, a great deal of the work done with ICTs may be going on and coexist with numerous ways of disengaging or not engaging with the same ICTs in everyday living at HBC. Working with ICTs and making ICTs work in everyday living are complicated matters that we have only begun to understand.

With this STS/ANT inspired approach – to being with – to understand relationships between ICTs and education, we can engage in different understandings of the nuances, complexities and ontological multiplicities involved in working with ICTs and making ICTs work in relation to everyday ways of living. Different things matter, and things matter differently to heterogeneous actors (e.g. math, HHX, HG, leaders, assignment modules, students, assignments, homepages, teachers, etc.) and things (e.g. assignments and communication) partially contain and become partially contained by ‘other’ things in everyday living.

This thesis has only touched upon an incredibly small part of what happens with ICTs in everyday living. There is so much that has been left out here. I wish to conclude this thesis with a sense of unfinished business. I wish to emphasize that there is so much more, and that it is important to continue researching the movements of everyday living associated with the continuous introduction of new technologies in today’s world. This thesis does not include all the empirical gatherings of relevance to this matter. The thesis partially represents things with its incomplete gatherings of snapshots of events. To illustrate this, the Appendix includes two examples of descriptions by HHX students (in the form of digital logbooks) of their everyday lives with ICTs together with my observation notes from the school days where I shadowed their activities at HBC.

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220 Not to be understood in the sense that this means doing the same in the same ways.
221 It should also be emphasized that while I have looked at two examples of teachers’ efforts to make the Assignment and Assignment Delivery functionalities work, there were other efforts not included in this thesis and my research. I did not come across any examples of ways to use these functionalities to handle assignments that seemed to work well at HBC. This, however, does not imply that generally these functionalities could not be made to work under other circumstances.
CONCLUSIONS

In a sense, this thesis constitutes a moment during processes of translations. It is a particular movement that partially contains variations of heterogeneously constituted movements/moments. It is a particular composition that includes some matters while leaving out others.

Even though I claim to be using a praxiographic/ethnographic approach to engaging with this research (Mol, 2002), throughout the thesis I have relied heavily on different people’s descriptions of the relationships involved in the ways the Studynet becomes part of and takes part in moving the everyday living associated with HBC. Mol (ibid.) argues that we can listen to people as if they were their own ethnographers:

> Not an ethnographer of feelings, meanings, or perspectives. But someone who tells how living with an impaired body is done in practice.
> The stories people tell do not just present grids of meaning. They also convey a lot about legs, shopping trolleys, or staircases. What people say in an interview doesn’t only reveal their perspective, but also tells about events they have lived through. If you agree to go along with this possibility for a while, and listen to patient interviews in a realist mode, the question becomes “what are the events people report on?”

(Mol, 2002, p. 15)

This thesis should be viewed along the lines of Mol’s engagements in the pursuit of doing things. The different ways in which a knowledge sharing system – the Studynet – is done/performed as an actor (or not) in and across variations of practices associated with the everyday ways of living at HBC have been in focus here. In order to engage in this, this thesis points out different relevant methodological choices:

- Engaging with a move from a focus on the Studynet as an autonomous object, a platform, with qualities entering practices into the Studynet as emerging practices – as partially existing platformations  
- Engaging with a relational and processual approach  
- Focusing on movements and engagement work  
- Engaging with a relational and complex concept of movements in everyday ways of living that does not assume to begin with the relationships of things and their space-timings  
- Engaging with moving contexts of knowledges and engagements, i.e. shifting specificities of what makes the Studynet an actor  
- Keeping an eye out for partially existing translations and partial connections
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- Keeping an eye out for variations of the relevance of, (dis-)engagements with, and partial (dis-)connections to and from the Studynet
- Engaging with variations of directions for engagements
- Engaging in understanding shifting movements and variations within
- Including ontological multiplicities

Latour, referring to Despret (2004), describes being a body as learning to be *affected* – that is to be effected – to be moved. Being a body means – in this sense – being “… an interface that becomes more and more describable as it learns to be affected by more and more elements” (Latour, 2004, p. 206). As a research object, the Studynet may be looked upon as a body that has become more and more describable as it has become articulated through engagements in relationships associated with HBC as well as this research.

Rather than engaging in a science which aims for representational statements – in the sense of true mimemic statements – Latour (ibid.) argues that we should think in terms of *articulations* and that any representation is a form of articulation, a description that inscribes, and is put into a particular script. The script can be in the form of writing, conversation, pictures, lists, models or a combination of forms. Articulations are the equivalent of Latour’s *propositions*, which entail three elements: “(a) it denotes obstinacy (position), that (b) has no definitive authority (it is a pro-position only) and (c) it may accept negotiating itself into a com-position without losing its solidity” (Latour, 2004, p. 212).

It is central to remember that Latour does not engage with a distinction between the world (object) and the thing (subject), which is an idea he promotes when thinking in terms of the body. The sciences work either from the pursuit of true statements, i.e. the representation of subjects, on the one hand, that mirror the objective world, on the other hand, or the sciences work from the pursuit of variations of articulations. Instead of thinking in terms of descriptions and bodies as referring to a *general match* – which Latour argues mostly results in experiences of failure – Latour encourages us to think in terms of descriptions and bodies as referring *com-positions*. Propositions describe *what* is articulated (ibid. p. 212). The *how* and the *what* are understood as being produced simultaneously. Learning to be affected is to learn *differences* and Latour, referring to Despret and Stengers, concludes that the sciences and good articulations must be *interesting*. Thus, Latour’s proposal does not mean avoiding a normative science. Engaging with distance or empathy (ibid., p. 219) is not the aim. The issue of importance then becomes a matter of being concerned with the problems stated by researchers rather than their solutions.
According to Latour, Despret and Stengers call for continually asking whether the problems stated are good ones. Good articulations do not merely repeat. Being interested refers to the *scientists*, the *elements* researched and the *articulations*. Instead of limiting prejudices and biases, this is a call for engagements and as many prejudices and biases as possible. The movement from *accurate science* to *imaginative and creative science* is also described by Latour as a move from less articulated (that is less engaged) to more articulated (that is more engaged) propositions (ibid., p. 220). Based on Despret and Stengers, Latour examines the difference between good and bad general explanations:

> Provide as general an explanation as possible is one thing; *eliminate alternative versions* is another. The emphasis on going from less articulate to more articulate propositions allows Stengers and Despret to sort out good ways of generalizing from bad ones. The good ones are those that allow for the connection of widely different phenomena and thus generate even more recognition of unexpected differences by engaging a few entities in the life and fate of many others. The bad ones are those which, because they had had such a local success try to produce generality, not through connection of new differences, *but by the discounting of all remaining differences as irrelevant.*

(ibid., p. 220)

For Latour (2005) good descriptions are risky, while being interesting and engaged take into account and trace actor networks and leave no actor as a natural given. This thesis includes many different coexisting variations of ways in which the Studynet becomes part of and takes part in moving the everyday living associated with HBC. It is not for me to decide whether the particularities of these accounts engage the reader in judging these gatherings (generally and/or particularly) as good or bad. This thesis reflects how particularly engaged I am with this research, and that I consider the elements as well as the articulations of this research as particularly engaged. The results of this thesis must, as with any other thesis, be understood as being *really constructed*.

I hope that readers will find the gatherings interesting, but no matter what happens in the hands of others, my intention is to represent the collations presented as *interested*. Interested is defined in the sense that the assemblages partially (dis-)include particular space-timings and agentizations associated with the Studynet, HBC, this research, thesis and their constitutive entanglements.

To open up this research, the chapters *An Introduction* and *Connecting* describe how moving my orientation from a learning philosophical and strategic focus to a focus on *movements* became necessary. This thesis indicates that the change in focus may be used as an entrance for studies that wish to engage in understanding the ways ICTs become part of and take part in moving everyday ways of living. The approach attempts
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to leave open what the agencies of ICTs may be – in this context the Studynet – as well as what the actors involved may be in the constitutive entanglements that make up ICTs as actors in education. Applying a STS/ANT inspired approach has been suggested here as well as the pursuit of what I call processes of agentizations, engagement work, and movements. Instead of the pursuit of learning potentials in e-learning research, it is argued throughout the thesis that there is a need to follow heterogeneously constituted enactments of relationships between ICTs and education. This is what I call suggestions for a science ‘of’ movements.

The thesis (Chapter 1) begins with descriptions of ways to partially (dis-)engage with the Studynet in Andrew’s math class. Then I move on to describe ways (Chapter 2) of partially engaging with the Studynet that enact engagements with the Studynet as full (dis-)engagements. Chapter 3 includes descriptions of ways to engage with the Studynet that are partially associated with full (dis-)engagement approaches. Chapter 4 illustrates differences between moving from the particular to the general (making ‘it’ work) and working with the general in ways that provide spaces for articulations of the particular (reworking ‘it’). Engagement work involves shifts between two coexisting processes of making variations that work and reworking variations. Any reworking is also a particular working that must be reworked in order to be made to work. These movements and processes of agentizations are not presented as generally good or bad. The chapter also illustrates that multiple movements and processes of agentizations become part of the engagement work involving ICTs, which then brings about challenges in the everyday living at schools that need to figure out ways to handle and set directions for handling their (new) ICTs.

Chapter 6 illustrates some of the partially coexisting (re-)workings of the everyday ways of living at HBC that emerged in relationships with the Studynet and also became partially associated with my research. This chapter presents and discusses variations of ways to enact communication and assignments with ICTs in the HG and HHX programs.

All the empirical examples presented in this thesis involve different approaches to the engagement work associated with making the Studynet an actor in the everyday ways of living at HBC. I discuss how different introductions of the Studynet to the everyday living coexist and emerge with various results. The introductions can all be viewed as part of the processes of translating a new ICT into meaningful relationships with HBC and its heterogeneously assembled and shifting constituting infiltrations. All of the examples include, in a sense, efforts that take their point of departure in the belief that using the Studynet provides better passages to engagements. This, as it turns out, is not the same as stating that we can either engage with ICTs by focusing on the technology
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(making ‘it’ work) or the pedagogy (reworking ‘it’). Instead, the proposition is made that engagement work includes efforts to make the technology work and in this regard, reworking pedagogical and organizational relationships – and vice versa. One consequence of this acknowledgement is that rather than focusing on where to go (e.g. constructivist teaching) or from where we came (e.g. instructivist teaching), schools engaging with new ICTs should look more carefully at their momentarily heterogeneously assemblaged situations (i.e. from wheres) and then figure out what possible and constructive partially existing to wheres there are. The directions and agencies of ICTs may be related to particular learning strategic aims and ambitions for movements, but this is not a general condition that forms a naturally given reason for engagement work with ICTs.

The empirical gatherings represented partially in this thesis are particularly good at articulating the heterogeneous relationships taking part in the constitutive entanglements of the everyday living associated with HBC. Instead of thinking in terms of general barriers, possibilities and potentials, this thesis advocates more of a focus on the shifting ontological platformations of things. There may be good reasons for teachers and other educational actors to repeatedly ask: Where can we find literature that supports and validates that this way of working with ICT is better? Loads of literature can be found. But the huge challenge is that while the ends (e.g. using the Studynet for handling assignments) may appear alike, the relationships taking part in producing these ends are most likely not alike. This thesis argues that there is a need to direct more attention towards these differences in relationships. Engagement work involving complex ICTs like the Studynet are not simple matters of first getting the technology in place, second, securing teacher and student IT skills, and, third, moving from learning to use IT to using IT to learn with. As the examples in this thesis illustrate, schools engaging with a technology like the Studynet become involved in shifting and ongoing processes of engagement work that are much more complex. The engagement work involves multiple reconfigurations of what partially contains educational programs and what these partially contain. Furthermore, engagement work involves multiple reconfigurations of what partially contains ICTs and what ICTs partially contain.

The examples presented in Chapter 6 illustrate the ongoing negotiations and enactments of what it means to handle the Studynet and assignments and to communicate in the everyday living at HBC. This thesis may appear to move somewhat unconventionally across assemblages of not-quite similar phenomena. Gathering examples of how HG teachers and their leader communicate with examples of communication in classrooms may appear as odd movements. However, the argument presented here is that this collage of heterogeneous situations and their constitutive entanglements makes it
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possible to see that schools and their human actors are not merely dealing with general matters of technology, knowledge/competencies, potentials, barriers and beliefs/attitudes; they are in fact dealing with ontologically multiple heterogeneous constitutions of relationships between ICTs and education.

This acknowledgement partially addresses a central question raised in this thesis: *How does a knowledge sharing system become part of and take part in moving the everyday ways of living associated with the secondary school programs at a Danish business college?*

This research suggests that the Studynet is not one stable thing to engage with in productive ways. The Studynet and HBC partially coexist with each other and their respective and partially collective constitutive entanglements. Therefore, the Studynet becomes part of and takes part in moving the everyday living at HBC in multiple and heterogeneous ways and vice versa. Simultaneously, the Studynet is both a peripheral actor (e.g. in math) and a central actor (e.g. in the E-learning Group). This thesis argues that the Studynet is realized as a multiple actor inside and across variations of heterogeneous assemblages of constitutive entanglements. The Studynet is presented as a partially existing actor and becomes an actor as the result of processes of engagement work that involve processes of translations of the Studynet, its identities and agencies, as well as HBC, its identities and agencies.

Empirical examples illustrate that engagements with the Studynet partially connect with something *from where* engagements become partially initiated, and with something *towards which* engagements are made. The *from wheres* and the *where tos* are manifold. This means that the passages between them also exist in many variations, and, hence, what the Studynet becomes is also manifold. Being something is presented as relationally constituted, and therefore, any being also becomes a particular movement.

The concept of remediation often referred to in Danish e-learning research, and the imaginaries that either schools are engaging with the e-learning revolution or merely more of the same, just with new tools/containers, have been thoroughly contested throughout this thesis. Engagements with the Studynet do not ‘just’ involve either adding to what is already there, doing the same, just more effectively, or radically changing education for the better. It takes effort to make a complicated technology like the Studynet work with education, and all *engagement work involves costs* and must be viewed as particular accomplishments that partially (dis-)engage.

Danish e-learning research has been heavily consumed with particular imaginaries of ICTs as change agents. This has lead research to appear over-enamored by certain
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engagements and understandings of engagements with ICTs. This thesis raises awareness of a need to also pay more attention to the shifting passages and their specificities involved in engagement work with ICTs.

Several passages, none of which can be described as either radical revolutions (in the sense of an instructional paradigm shift) or remediations (in Bolter & Grusin’s sense) have been included in this research. For example:

- Math: Passages between different materialities of handling math such as paper, Mathcad, classrooms, the computer lab, the Studynet, etc.
- Assignments: Passages between different materialities of handling assignments such as paper, the Assignment and Assignment Delivery functionalities on the Studynet, databases, classrooms, the computer lab, etc.
- Structuration and planning: Passages between different materialities of handling structuration and the planning of one’s teaching activities such as teacher homepages and class and subject websites on the Studynet.
- Communication: Passages between different materialities of handling communication such as e-mail, Messenger, the Discussion functionality on the Studynet, face-to-face meetings, etc.

This thesis illustrates some of the shifting ontological compositioning of these and other matters, and emphasizes that they must be understood interrelationally. This implies that in order to understand the movements in everyday ways of living with the Studynet, it becomes central to remain attentive towards what momentarily holds things (e.g. math and assignments) and what they hold. Processes of agentizing the Studynet exist inside these relationships. Inside these interrelationships math, the Studynet, and their momentary constitutive entanglements, i.e. what they hold and how they are held, gain agency, i.e. identity. And it is inside these interrelationships that momentary (in-) compatibilities between math and the Studynet can be ‘found’.

How does this relate to Latour, Stengers and Despret’s engagements with science and good/bad ways of generalizing? I have attempted to illustrate that movements happen no matter how we appreciate or let ourselves become affected by them or not. And the same movements may become enacted as either bad or good. Inside variations of relationships, movements become engaged as pro-, dis- and com-positions. When engaging with the Studynet, the human actors at HBC are faced with many possible
moments of bifurcations. The problem with favoring good ways of generalizing (e.g. those that allow for the connection of widely different phenomena) and rejecting bad ways of generalizing (e.g. those with such local success that they try to produce generality) may be that either description describes existing phenomena, and for a science ‘of’ movements to start by disengaging with either one and the partially existing effects of these would be a fatal mistake. This is especially true in light of the fact that enactments of standards may be related to emerging possibilities of connecting widely different phenomena (e.g. de Laet & Mol’s bush pump). Particular explanations (e.g. the ones presented in this thesis) may not necessarily produce this. They may represent instances of what it means to connect the Studynet with widely different phenomena, but they do not imply that these instances are themselves generalizable. The Studynet was not produced as a standard that connects widely different phenomena associated with HBC. Rather, it becomes a point of reference for engagements in many different things. The Studynet is gathered through this engagement work with things and vice versa. This is another reason for turning attention towards what appears to be heterogeneously assembled situations of engagements, rather than trying to understand engagements with the Studynet and their possible benefits by seeing the Studynet as providing a place/space/environment/context for engagements.

Referring to ICTs like the Studynet as knowledge sharing systems is, in this sense, misleading. The Studynet does not function as a system for sharing knowledge in itself. It may be more appropriate to refer to the Studynet as partially existing as a kind of momentary working net of relations that can become included as well as excluded in and that may include as well as exclude a variety of matters and relationships. The Studynet could also be referred to as an information network – i.e. a working net of things that are put in formation. Inside constitutive entanglements, the Studynet may appear as a system for sharing knowledge. In this research the Studynet is enacted as an emerging and ontologically multiple actor taking part in putting HBC and what it means to handle everyday ways of living associated with the secondary school programs at HBC in formation.

With a reference to Despret and Stengers, Latour (2004) describes the difference between good and bad science and explanations as being in-between a body of accurate detached science and creative and imaginative science that acknowledge variations and interest. But I would say that both kinds of science acknowledge variations and interest. They do it differently though. The difference produced is instead between the sciences and their knowledge practices. Science may emphasize generalizable knowledge or particular engagements – this creates different movements – different bifurcations. Either way particular (dis-)engagements are produced. Enacted as a contrast, each approach, however, implies the need to engage with the other. Too much particularity
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brings the need for commonality, and too much commonality enacts the need for particularity.

In order not to end up producing research that generally overlooks and enacts too much of one thing, I suggest that we entirely bypass this distinction (which I also take Latour to be advocating elsewhere) and instead focus on variations of enactments of movements in whatever disguise (including this distinction) they may come, i.e. we should engage in *learning to be continuously affected, to be sensitive*. Consequently, we should not and need not start by inserting what is a generally good or bad explanation, type of bifurcation or science. Perhaps science does not have to be about good generalizations?

We may also discover that what is at stake is not merely a contrast between good and bad. This thesis and my research approach are about *movements*. The chapters represented here are variations of ways to engage in moving the contexts of knowledges and engagements, i.e. as variations of movements. One could criticize Latour, Stengers and Despret (as they are referenced by Latour) for enacting another natural ground for what are generally good and bad passages of research. But the formulations made by Latour, as I understand them, include every variation. In that sense, providing “as general an explanation as possible is one thing; *eliminate alternative versions*” is another. Even though this could also be interpreted in the sense that it is in fact possible to provide a form of general explanation that does not in some sense eliminate alternative versions, I assume this is not the message. I take Latour’s proposition to be a suggestion for a science that does not disengage particular movements to begin with, but strives to understand and include all entities and their relationships – also the ones that appear to be frozen, standing still, bad, exclusionary, etc.

This research engages with a science that emphasizes movements, but attempts not to insert, to begin with, what the movements entail, and acknowledges that also science take part in producing movements – thus both adding to and subtracting from existing variations. Sometimes as exemplified in Chapter 5, movements appear as particular variations of standing still. This thesis does not attempt to produce generalizations. Inside the entanglements of this research, the challenge is that the relationships emerging partially from engagements with the Studynet do not seem to be simply generalizable. This, of course, can also be viewed as a kind of generalization and one which is quite interesting. It implies that we should engage more in variations and particularities because sameness and what appear as commonalities may be understood as the partial result of heterogeneous relationships enacted as relating/referring to one or more things, e.g. assignments, communication, ICT, etc.
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As discussed in chapters 3 and 4, handling assignments with the Studynet and engaging in discussions involving the Studynet may appear inside certain chains of associations as unsatisfactory. However, as the examples in Chapter 6 illustrate, inside other chains of associations, handling assignments and engaging in discussions involving the Studynet may appear as *differently productive engagements*. Both what contains the Studynet, discussions and assignments as well as what discussions, assignments and the Studynet may contain are manifold and continuously reworked.

The examples in Chapter 6 primarily illustrate that the Studynet always became reengaged in different constitutive entanglements, partially reworking the agencies of the Studynet and the matters in relation to which it would become an actor. The huge challenge is that engagement work, whether it appears to be producing good or bad passages, becomes a matter of relationships, and hence good and bad passages are accomplishments and partial products of engagement work. They are not necessarily the entrance point to things. In order to get ‘there’, a good deal of translation and entanglement work has to be done.

This thesis includes some of the mechanisms and machineries that take part in enacting the Studynet as an actor in the everyday living associated with HBC. This study should at best be understood as an inconclusive attempt; it raises more questions than answers. For example, inside which entanglements should the Studynet’s agency as an assignment container be judged? Which assignments should be included? And how should assignments that take form of discussions be approached? What about the everyday organizational task of discussing the organization of things in education? How can this task be put in formation in relationships with ICTs?

The examples illustrate concrete ways to practically work and rework some of these issues in the everyday living at HBC. Everyday living does not imply that any of the examples are equally relevant to each and every person every day at HBC. This is in fact another point. Instead, each instance represents a particular way of (re-)working the everyday ways of living associated with the Studynet. This means, that when following, e.g. students and teachers in their everyday course of activities, it may not seem like a large number of (re-)workings, and thus movements of engagements in everyday living, are happening. Perhaps the articulations of differences – in what Strathern (2009) refers to as *the moments of bifurcation* – make us become aware of movements and thus also the (re-)workings involved in particular engagements. These moments may be so subtle most of the time that we have difficulty in recognizing them. Furthermore, recognizing them involves enacting them and thus enacting more bifurcations, which is quite a research paradox.
This thesis has only touched upon a few of these moments of bifurcations. Distinctions between things maintain things in relationships (ibid.). I too have enacted moments of bifurcations with this thesis. I invite the reader to not be too certain about them. They are to be found in the bridgings and distinctions made in the chapters, in the sections in chapters, in the enactments of relationships involving HBC, the Studynet and their associated actors, etc., as well as my STS/ANT inspired proposition that we understand all bifurcations – as *movements within*.

The limitation of any of the illustrations made in this thesis is that they exclude many important relationships, e.g. in Chapter 6 I only refer to one particular enactment of each of the events. I cannot (in general) tell from these descriptions how all the human actors engaged in the activities experience things. Some of the human actors may have differently experienced the events as problematic and/or productive. My descriptions also represent an arrangement and articulation and thus a particular framings of things.

Many relationships are not included here. To illustrate this, the Appendix includes articulations of the ways ICTs take part in students’ everyday lives. In a sense, this is another way to confirm what has been already stated in this thesis: We need to attend more to the ways relationships between ICTs and everyday living become enacted and sustained or not. If we wish to understand how a knowledge sharing system becomes part of and takes part in moving the ways of everyday living associated with the basic vocational and commercial upper secondary programs at a Danish business college, we need to engage in the *processes of mobilizing the knowledge sharing system as an actor* (or not). This implies learning to be sensitive towards the connections and passages between connections enacted in everyday living – in other words, we need to turn our attention to the forms of the forms of (dis-)connections and (dis-)engagements made (including our own).

From ‘this approach’ emerges a different option for enacting commitments to support the ongoing engagement work with ICTs that has today become an active ingredient and real challenge (though differently enacted in various places and times and for different actors) in what it means to make educational programs that work in Denmark.

Elaborations of the ways in which ICTs take part in the everyday lives of students have not been included in this thesis. However, the descriptions in this thesis make it clear that talking about ICT integration in education in general terms as matters of frequencies in IT use in relation to particular categories of activities (i.e. assignments, project work, etc.) is an approach that is much too simple. Surveys asking teachers and students about their ICT use in these general terms do not engage in the heterogeneous relationships that are fundamental to ICT integration in schools. Furthermore, studying
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ICTs as matters of engagements in everyday living brings to the fore that the heterogeneous and multiple space-timings and agentizations of ICTs in education must be understood empirically as matters related to the ongoing ontological compositionings of everyday ways of living relating to education.

The descriptions from student logbooks and from my observation notes (see examples in the Appendix) illustrate that not only are students’ everyday lives composed very differently, but also their engagements with ICTs vary from person to person and from activity to activity. Furthermore, the descriptions illustrate that in relationship to the everyday school activities, many different ICTs become engaged depending on which activities and subjects teachers and students are currently working with in school. The descriptions also illustrate that even though there are computers with Internet at Trollesminde Allé, they do not always work. This is described, however, as part of the way things are sometimes.

These descriptions (and the other student descriptions not included here) indicate that, for example, the previous chapters’ descriptions of teachers’ engagements with the Studynet lack important insights into other relationships also involved in the entanglements of the activities that were described, e.g. the ones associated with student engagements. For example, for the descriptions of Andrew’s arrangements for math teaching activities, I have not been able to include student engagements in the events. Another central limitation to this research is that even though I claim to be dealing with everyday engagements with the Studynet in HG and HHX programs, I have not satisfactorily included the variations of constitutive entanglements involved in everyday living associated with either of these educational programs. In this and other senses, the descriptions in this thesis do not adequately include the ontological multiplicities and complexities involved in engagements with the Studynet in the 2004-2005 and 2005-2006 school years at HBC.

I find that the different materialities of the empirical gatherings represented in this research illustrate an important point related to what it means to claim to be engaging methodologically in moving contexts of knowledges and engagements. The descriptions, e.g. from Philip’s logbook and my observation notes (see Appendix), provide different details about the everyday ways of living with ICTs associated with Phillip. Things are not gathered within each description (Latour & Hermant, 2006), but in-between the descriptions. It is important which descriptions and which gatherings are made. For example, the student logbooks provide insights into the everyday living with ICTs from morning to evening every day of the week, but they are detailed differently than, e.g. my descriptions of the school day. In addition, my observation notes and the student logbooks contain things partially in different ways than conversations,
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interviews and on-line observations. This is another concrete way in which this research has attempted to move the contexts of knowledges and engagements.

The descriptions in the Appendix demonstrate that the Studynet partially participates in the everyday living related to students. It is not always the point of departure for student activities, but it is an active ingredient in what it means to be a student and engage in activities related to HBC. While the Studynet may become entangled with many relationships involved in being a teacher, leader or student, the students and their everyday lives, at the time, do not involve the Studynet as the center of attention. The students and teachers generally do not work from the Studynet. Working with the Studynet and making the Studynet work in relation to the everyday living ‘of’ different actors involves manifold partial associations with things. The Studynet becomes partially contained in and partially contains everyday ways of living related to students and these relationships are different from those relating to teachers and leaders. This is a central point that needs further elaboration in future studies that explore the question: How do ICTs partially contain and become partially contained by the everyday ways of living related to various actors?

Understanding engagements with the Studynet

This thesis mainly relates to the human actors represented in the E-learning Group. These actors are used as partial points of departure for engaging in ways to grasp engagements with the Studynet in the everyday ways of living at HBC. This thesis raises the question of how the Studynet takes part and becomes part of moving the everyday ways of living associated with HBC. This thesis illustrates that the answers to this question are manifold. If anything general has played out at HBC, it must be that engagements with the Studynet are heterogeneously constituted. This is the case in the sense that all engagements must be relationally understood, and that the full engagement approaches represented by the yellow pages strategy at HBC and the representations of the DDU.net and Microsoft Learning Gateways as the new digital platforms for things do not realistically describe the nature of the engagements with the Studynet at HBC.

Many partially existing variations of the Studynet circulate and emerge at HBC. However, these variations are not easily described by one strategic way of engaging with the empirical gatherings, e.g. in interviews with teachers or leaders, or in an analysis of the activities within the Studynet at a strategic time. Instead, by following the circulations and (dis-)establishments of the Studynet as it becomes translated inside

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222 These ‘groups’ do not contain the same kinds of people and thus do not comprise homogeneous relationships.
Conclusions

shifting contexts of engagements and knowledge – shifting relationships – I have illustrated that movements in the everyday living associated with the Studynet are much more complex, uncertain and ephemeral than Danish e-learning research generally anticipates.

Furthermore, the optimistic/pessimistic determinisms (Friesen, 2008) often accompanying e-learning research and knowledge sharing systems do not do the ICTs or schools involved justice. Even worse, these approaches are likely to ignore that the addition of ICTs may not simply substitute, extend or revolutionize what is already there. Engagements with the Studynet both partially add and subtract from ways of engaging with activities in the everyday living at HBC. The Studynet does not in itself have agency to be either a generally good or generally bad technology. Both the space-timings and agentizations of the Studynet vary inside relationships with HBC and ‘its’ associated actors; this calls for finding ways to handle the uncertainties that go along with making compatibilities between the Studynet and everyday ways of living at HBC. This is a different matter than asking: How can we get education to engage in the cultural revolutions needed to embrace the learning potentials of ICTs?

Often the precise way that the term e-learning is used is dependent on an author’s particular purposes or specific research agenda. For example, in E-Learning and the Science of Instruction, instructional designer Ruth Colvin Clark and cognitive psychologist Richard E. Mayer (2003) describe e-learning essentially in terms of multimedia technologies and theories of individual learning and cognitive processing: “E-learning,” they explain, “should promote psychological engagement between the learner and the lesson content in ways that help learners to select, integrate, and retrieve new knowledge” (p. 151). In a book titled E-Learning in the 21st Century, distance education specialists D.R. Garrison and Terry Anderson (2003) speak of e-learning principally in terms of its “unique ability to bring together a community of learners, unrestricted by time or place” (p. 12). Instead of seeing a single learner engaged with content as the paradigmatic e-learning scenario, Garrison and Anderson understand e-learning primarily in terms of what they call a “collaborative constructivist” framework of learning and communal inquiry.

(Friesen, 2008a, p.12)

To supplement Friesen’s otherwise correct observation, we can add that the way the term e-learning is used is always related to particular interests, purposes and agendas. This is no less true here. This thesis translates e-learning into relationships between ICTs and education – more specifically the Studynet and HBC. This thesis discusses how we can research relationships between ICTs and education, and has done so by empirically researching the enactments of relationships between the Studynet and HBC. In this sense, it has been presented as a partially existing and relationally enacted – thus momentary and manifold – product of sociomaterial relationships rather than as a particular way of engagement with ICTs providing certain specified/specifiable effects.
Conclusions

This thesis does not simply suggest substituting one set of scientific beliefs and methods with another. I would like the reader to understand this thesis as an inconclusive attempt to engage with e-learning research without starting with particular beliefs in and advocations of what can/should be a better research foundation upon which to begin. Still, this is also a sort of recommendation. As Strathern (2004) suggests, any connection is another disconnection, and I will supplement this by adding that any proposition is another dis-position that enacts certain com-positions. Engaging in the shifting and partially existing pro-, dis- and compositions enacted in the living world is essential. Researching relationships between ICTs and education represents just one mode of entrance (that may contain many modes of entrances) into this engagement.
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224 “This translation is being given free of charge, please do not use it without acknowledging the original source on the web and the original printed version in French: Bruno Latour and Emilie Hermant (1998). *Paris ville invisible.* Paris: La Découverte-Les Empêcheurs de penser en rond. This text is not understandable without the pictures. It is provided simply to help those who have difficulty tracing the complete legends on the web” (Latour & Hermant, 2006).


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EVERYDAY LIFE WITH ICTS RELATED TO STUDENTS

Avril: I am annoyed because we can’t use Hotmail when we are in school. I find it annoying because I use it often, and because when I need to communicate with people about something, for example, my employer, who sends me an email – schedules and stuff. People e-mail me from … Germany, from Silkeborg … lots of important stuff. They mail it to us, and then I find it annoying that I can’t check things. But I also use the other mail. Of course.

Mikala: The Studynet mail?
Avril: Yes, I mainly use it internally for school. The Hotmail is more external.
Mikala: Do you have any thoughts on why you don’t use the Studynet for external mails?
Avril: Hmm … Actually I don’t know. I think it’s because I’m so used to having Hotmail. It would be … not using it now … I graduate soon. Then I won’t have that e-mail address anymore. I have to have something to fall back on. And I’ve had my Hotmail for so long that it has become a stable element.
Mikala: Do you know how long you’ve had it?
Avril: The Hotmail? I think I’ve had it since ninth grade, which means ninth, tenth, HHX1, HHX2, HHX3 … 5-6 years.
Mikala: That’s a long time.
Avril: Yes.²²⁵

Avril was an HHX3 student at HBC in the 2004-2005 school year. The above excerpt illustrates many important relationships at play when education introduces and associates ICTs with students’ everyday activities. First of all, it illustrates that not only are ICTs things that come into existence in relation to the everyday living related to education, but they also partially exist in relationship to variations of human (i.e. Avril) as well as non-human (i.e. Hotmail) actors. Furthermore, Avril’s engagements with the everyday living related to school may be linked with other aspects of her life that involve a composite of heterogeneous coexisting practices and circumstances associated with, for example, her work and social relations as well as her past, present and future engagements.

Avril was one of six²²⁶ business college students that volunteered to help me study how ICTs took part in everyday living related to their adolescent lives in the beginning of

²²⁵ Interview with Avril, an HHX3 student, conducted by Hansbøl on April 13, 2005. In order to motivate students to use the Studynet as the point of departure for their activities, the school cut off access to Internet services such as Hotmail from school computers.
²²⁶ One HG2 girl, one HHX3 girl and boy from the same class, and three HHX2 boys from the same class.
Appendix

2005. This appendix introduces everyday living related to HBC as taking its point of departure in two of these students’ descriptions of the ways in which ICTs took part in their everyday living – related and unrelated to their studies at HBC. The following descriptions furthermore include my observations of their school activities using school day observations and conversations with the students. *Italics* indicate the students’ own words when they appear in sections that include my observation notes.

**Philip**

Philip (18 years old) was an HHX3 student in the 2004-2005 school year. He invited me to shadow his school activities for one school day in January 2005. He also wrote a digital logbook covering five days that uses words and screenshots to describe how ICTs were part of his everyday activities from when he got up in the morning until he went to bed in the evening, Monday through Friday.

**Monday, January 10, 2005**

My day started with me getting up around 6-6:30, and after getting ready and eating breakfast, I went upstairs to turn on the computer, which I do every morning to check my schedule and an Internet-based game on http://games.swirve.com/utopia/. The front page looks like this:

![Game Front Page]

I have been playing this game for the last four years, and I expect to continue playing for a long time.

Today my classes are:
Appendix

Business law
English
International economics

I haven’t used the computer today because all my classes consisted of talking and introductions to new assignments to do using books relating to the subject being taught.

Several times during the day I checked http://games.swirve.com/utopia/ to keep up. I totally love this game.

Actually, I did use a computer a little bit in International Economics when I was looking for something on Danish monetary policies.

In the evening, I’ll sit around for 2-5 hours and play Diablo 2, Lord of Destruction. This is a screenshot of the game:

![Diablo 2 screenshot](attachment:image.jpg)

Just so you know, I don’t play every evening, because sometimes I don’t get home until about midnight. Then I go to bed right away.

Tuesday, January 11, 2005
The day started just like yesterday. I left home at about 8 to be sure to get to school on time.

My classes today are:
Appendix

International Economics
Danish
English
Business Economics
IT

In International Economics we talked about global EU monetary policies and I used www.google.dk to check if there was anything on the joint monetary policies that was interesting to use. I found a homepage from the Danish Ministry of Finance, http://www.fm.dk/1024/visPublikation.asp?artikelID=5668>, that had many good things that could be used in the discussion on EU global monetary policies.

In Danish we only had a half a lesson because of the morning assembly. Students who had not gotten their essays back got them back and then we watched a movie about recent times.

In English I used the computer to do an assignment that we had to do and were going to go through in class.

In Business Economics I only used IT a little because we went through some exercises from the book. Afterwards, we did some exercises that you can do on the computer. It wasn’t very difficult and I almost fell asleep from boredom! Unfortunately, that’s how it is once in a while.

In Information Technology class I used IT a lot because we are currently doing homepages with Stone’s WebWriter. We also went through a chapter in our book that was about WWW and HTML. I was supposed to present something but I hadn’t read the chapter so we went through it together on the blackboard.

Wednesday, January 12, 2005
Hardly any school for me today because I had to attend a meeting. I got to school for the last two classes. They were:

International Economics
IT

We did not use IT in International Economics today because we were going through some exercises we were supposed to on at home or in school yesterday.

In IT we used computers to start doing our homepage in Stone’s WebWriter assisted by our book.

Thursday, January 13, 2005
Today my whole family got up late, so I only just about managed to check my schedule on the net before I had to run to school without breakfast. Today Mikala was going to follow me around and watch me like a fly on the wall to see how the students use IT in the classes I had today. My classes were:
Appendix

Contemporary history
Information Technology
Business Economics

In contemporary history I used IT to do an assignment that our teacher had uploaded to the intranet [the Studynet]. It contained links to stories/facts about the things we were supposed to work on for the assignment.

In Information Technology we used IT a lot while we were doing our homepages. We are following every chapter in our book step by step.

In Business Economics I did not use IT to begin with. But after the first class, the teacher gave us some exercises to do. I did those on the computer.

Friday, January 14, 2005
This day started out perfectly because I got up on time for once this week. All the other days have been going wrong because I have gotten too little sleep.

I checked today’s schedule and, most “important” of all, I checked Utopia.

I had time to relax before going to school, which was great! Today I was also able to ride to school because I went to pick up my bike yesterday, so I didn’t have to think about how long it would take to get to school, which was something I had to do the other days because I’ve had to walk to school :-(

Today’s schedule:

Information technology
Danish
Industrial economics
English

In Information technology we used IT to work on the homepages we had already started working on!

In Danish I used IT to visit www.google.dk and find something about a novel by Naja called “As the Angels Fly” (Som Englene Flyver) (1993). In this case I found two really good homepages, where one had an assignment about the novel and the other one contained an interview with Naja about her novel.

In industrial economics we went through the exercises we had to do for today.
Appendix

In English we didn’t need IT because everything happened on the blackboard, which is rather boring. To be honest, I almost fell asleep several times because it was so boring ;(

The biggest reason why I almost fell asleep was a presentation 3B student did today who talked without a single break, which makes it impossible to follow, and then you get tired instead of listening to what is being said.

On Thursday, January 13, I shadowed Philip at school. The following section contains my field notes, translated from Danish, from that day:

The first class in contemporary history is taking place in class. The teacher is going through the ‘text of the day’, which the students should have read for today’s lessons. The teacher is showing overheads. The students are expected to go outside the classroom and work. Paper copies of the assignment have not been made. They are available under Assignments on the history site on the Studynet. The topic is “Reconciliation in Cambodia”. They get one class [60 minutes] to work on the assignment.

Philip explains that he mostly works alone. He logs onto the Studynet and finds the assignment and one of the links it refers to: http://www.dr.dk/undervisning/forsoning. Philip also explains that the teachers do not always upload the assignments on the Studynet. Avril, next to Philip, tries to play a video but the computer will not let her. At 9:36 AM it is time for a break. Philip uses the break to check on his favorite game.

Philip comments: “Sometimes the computer doesn’t want to do anything. You can write that. Suddenly it gets stuck and then you can’t print or anything.”

Philip communicates [in writing] with other players. Yesterday, he was writing with another player for one and a half hours.

At 9:46 AM Philip concludes that this is what he had time for. He returns to the assignment and opens his Word document. He tells me that one advantage of having IT is that he has a folder on the network drive that nobody else has access to. He prints the document and picks it up at the printer.

It takes a long time to upload on the Studynet, Philip explains. This is why he prefers to use the server for small assignments that he does not need to work on at home.

Philip goes out for a cigarette and then returns. Avril, who is sitting at the computer next to Philip, comments that she has now spent almost ten minutes trying to gain access to the Studynet. She has been trying to logon on two different computers, each working very slowly. Philip returns from the cafeteria with two hotdogs and buns and a half a quart of chocolate milk.
9:50 AM the class is gathered in the classroom again to go through the students’ answers for the assignments as a group. One boy in the back of the class has brought his own laptop.

During the next break Philip informs me that the next Danish lesson is also going to be in class. During the break, Philip plays poker with three other boys.

The Danish teacher, Catherine, has prepared for the class to watch a video on the class video machine and television. It is a documentary about recent times (*Den Nyeste Tid*). It is about theater, art, music, literature and movies from the 1990s.

After watching the movie, the class engages in a discussion of the documentary. Then Catherine gives the students some questions on paper to be worked on in groups.

During the next break Philip leaves to make a phone call. It is the lunch break, and we agree to meet up for the next industrial economics class, subject Philip has chosen to follow. This means that students from different HHX3 classes participate in the class.

During the industrial economics class a girl knocks on the door. She is looking for her cell phone. Another student calls the phone and a third student somewhere on campus answers it. They find the phone and the girl makes an excuse on her way out.

The teacher presents today’s agenda:

Going through exercise 11.4  
Distribution of theory  
Exercises 11.7 -
Chapter 12 theory

The form of instruction is classroom teaching with the teacher explaining and writing on the blackboard.

Seven minutes into the lesson another girl walks out of the class to talk on her phone and then returns after a few minutes. Throughout the day I have noticed that not many students take and only a few of them have their books open. Generally, there is also a lot of small talk and laughing during class. This classroom has no wireless Internet access. In Philip’s HHX3 classroom they have wireless access.

Approximately thirty minutes into the lesson, the teacher finishes talking at the blackboard and turns on the overhead projector. Eight minutes later he allows the students to work on their exercises. He tells them to meet again in fifty minutes.

Philip tells me that he needs some air. He is tired because he did not sleep that much last night.

The teacher approaches me and comments that it is a shame that I have come on such a boring day like today where the subject is deadly dry. He says that I am more than welcome to join in some other time if I have extra time one day.

In the common room Philip is on the search for balls for the computer mice. All the computer mice seem to have lost them. But Philip says that he can do most of the work with the keyboard using shortcuts. But the computer is frozen and Philip cannot log onto the computer.

Finally, Philip succeeds and he finds www.swirve.com, where he plays Utopia. He explains enthusiastically that in 2002-2003 it was nominated as the best Internet-based multiplayer game. According to Philip, every year at least approximately 70,000 gamers play Utopia. Time is condensed in the game because one hour real time equals one day “in there”, and one day of real time equals one month. Philip’s fingers now move speedily on the keyboard. It is impossible for me to follow and understand what he is doing.

A couple of boys passing by say that the balls are being used to play ping pong in the cafeteria. You can save 5 – 10 kroner if you bring your own ball.

Fifteen minutes before meeting with the class, Philip decides to go to the cafeteria. I remain in the common room. At 2:00 PM everyone is in the class except for a few students who are listed by the teacher as absent because they went home. The teacher is going through the assignments at the blackboard. One of the students, hiding what he is doing behind his jacket, writes text messages for most of the class. One of the girls asks if they can go through the assignments together now that they have been doing them. The teacher says he had the impression that only the girls had actually done the assignments. For the rest of the class he asks the students questions, and many of them join in and participate actively in the activity.
The next day in the copy room I meet the teacher, who tells me that the teachers have an ongoing discussion about whether motivating the students is their job.

Michael

Michael, who was an eighteen-year-old HHX2 student, invited me to shadow his school activities for five consecutive school days in March 2005. He also wrote a two-week digital logbook in January that uses words, screenshots and his own digital pictures to describe how ICTs were part of his everyday activities from when he gets up in the morning until he went to bed in the evening every day of the week.

Monday, January 10, 2005

I use IT a lot in everyday living, though not so much in school as I maybe ought to. I mostly use my computer to chat on MSN, be on the Internet, send e-mails, work, do school assignments and search for information. I wouldn’t call myself the ultimate “IT nerd” because that is definitely not who I am.

Since I took a driving test today I haven’t used the computer apart from installing this program and chatting a little on MSN. Oh yeah, I have of course been writing numerous text messages :)

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227 Three days before the spring holiday and two days after.
228 The digital logbooks were written using Microsoft’s OneNote program, which each of the students received as part of their participation in the project.
Appendix

Tuesday, January 11, 2005
Today, I used the Internet more than yesterday. As you can see from the screenshots I have been working [refers to the screenshot from the McDonald’s intranet where he works as a manager] and entertaining myself on www.nightleif.dk and www.dkbn.dk. Both sites contain pictures from parties from the weekend. In school I sent a couple of e-mails and I got the digital camera from you. I have already tested it, he he. Hmm … otherwise nothing much has happened. I have been sending some text messages, actually I just looked at my message counter, and since January 2, I have sent 375 messages.
Wednesday, January 12, 2005
Hey, I have just read your mail about writing something more about how I use IT in school, so I am going to do that :) 

The last couple of days I have not used very much IT for school because we have not really had any assignments. I have, of course, been using the Studynet a little to use my e-mails but mainly the last few days have been on the Internet have purely been for entertainment and, of course, work.
I have also been listening to a lot of music on my computer. This is the easiest way. I’ve connected the stereo I bought last year to my computer because this is the easiest way. This way I can hear music and the sound from my games on my loud speakers. The effect is much cooler when there is surround sound.

Thursday, January 13, 2005
Today, I have been in school from 8:30 AM to 2:00 PM. We were lucky to get off early. Today, I drove to school, just like yesterday. Because we got off early, I had to write a text message to the people who normally drive with me saying that they had to take the bus instead. I didn’t feel like waiting for them for a half an hour. Today in IT B we started an extended assignment/case about Daloon. We have to do a four to five page synopsis in which we answer the questions the teacher has handed out. The assignment must be done using a computer. So we have been using IT a little today. After going to get my hair cut, today, I drove to my house where I burned two CDs for one of my girl friends when she stopped by. I did not take screenshots from this activity, so you’ll have to manage with the text :)

Friday, January 14, 2005
Finally, it’s Friday. Awesome! :) Friday afternoon is the best time of the week because you can take a nap, he he. Well, what did I use IT for today? In industrial economics we got a Ppt. presentation about the Gazelle game, which we will be starting next week. I checked my grades on the Studynet and I have calculated my average, which is 9.3 [on the old 13 scale, and it was a little higher than average,
which used to be an 8] da da … Hurray :) excellent … he he … later I went to work, so there wasn’t much IT today …

Saturday, January 15, 2005
Sunday, January 16, 2005
Sunday ought to be the most relaxing day of the week, but not for me because I have been working all day from 8:30 AM to 6:00 PM, a really long day ... YAWN ... I took some pictures of the stuff at work involving IT, i.e. our finger touch cash register, which is updated regularly by the main computer in the office. There is a direct connection between the registers and the computer. This way the manager can continuously monitor our turnover and sales figures. Very clever.
We use all these registers, fax machines, computers, etc. every day to make the restaurant run smoothly.

This intranet homepage is a page that most McDonald’s employees have access to from home. From this page, it is possible to check your work shifts, write e-mails, chat, keep updated about campaigns and much, much more. My job is to update this intranet page for our restaurant, which is why I spend a lot of time on it.
Monday, January 17, 2005
Then it’s Monday once again and we have now begun the second week of writing in our logbook :). Today, I’ve written very few messages for a change, I don’t really know why, but it happens once in a while.

In German class I did an exercise on the computer (in Word of course) and I saved it on the Studynet so that I could finish it at home. It makes it a lot easier to transfer documents now that we have the Studynet. It is, however, a bit more difficult than saving things on a disc.

If I’m supposed to write some more about how I use my cell phone, more than just sending text messages and calling, then I need to say that I use the calendar, of course. If I combine it writing down homework the old fashioned way, then it is easier for me to remember my appointments, also because the phone has a reminder feature.

Today, I have also had problems opening OneNote. The program kept on shutting down when I wanted to open it. When I finally managed to open it, it was labeled ‘read only’. But that’s what happens once in a while. It’s just really annoying if you are busy. He he ;)

Of course I have also used MSN today; I do that every time I’m on the Internet, so that is not really something new.
Tuesday, January 18, 2005

Yesterday was the take off of another week with the logbook :)

Today I came home from school, did some homework, of course, on the computer because it is the easiest way when you have to write a lot of text. It was an English letter that I had to translate. I use a digital dictionary to look up words when I do assignments. It makes it all much easier and quicker.

After having done my homework, I drove to work. I read a couple of e-mails from some employees and then I introduced another manager to our new intranet. I also updated the intranet for our campaigns. At 7:30 PM there was a two-hour manager meeting, so how much IT I could use was limited. After the meeting I went straight home to bed, because it was extremely tiresome, he he :).

Wednesday, January 19, 2005

The day before the day before weekend :) he, he. Yes. Today, in industrial economics, we checked how things are going on the Gazelle game [a simulation game]. The game, which is about managing your own windmill enterprise, was designed by Børsen. Our group had 2,000 windmills on back order (not too good). Yesterday was the takeoff of another week with my logbook :, but we learn something every day.
Then when I got home I had to check my e-mail and print an assignment for a friend because his printer didn’t work. He e-mailed the assignment to my Hotmail. After that we sat around watching movies all evening on my home cinema (nice :)), but now I want to go to sleep so that I will be wide awake for tomorrow.

Good night :)

Thursday, January 20, 2005
Now it’s Thursday. Today, I returned the digital camera, so no more pictures.

So what did I use IT for today? Of course I’ve checked my e-mail and written messages, which is something that I do almost every day. I heard 100FM on my cell phone on the way to school. It’s great that cell phones can be used as MP3 players so I avoid having two “machines”, then I only need a cell phone.
Friday, January 21, 2005
Weekends are not the time when computers are used the most. At least not in my family. Today after school I went straight to work. At work we use a lot of IT for accounting, inventory management, etc. Today, one of the registers broke, so I had to call IT support because the register is actually a computer. Without a keyboard, well, it’s possible to add a keyboard when necessary. It turned out to be the power supply that was malfunctioning, so I just had to change that. Except for IT at work, I have actually only been writing text messages.

Saturday, January 22, 2005
Saturday was even more boring than Friday, especially since I didn’t go out either day … he he … Saturday morning I went to work again at 8:30 AM, less than eight hours since I had gotten home from work. So, I was actually quite tired when I finally got off at 5:00 PM on Saturday afternoon. In relation to IT, I actually went to bed early Saturday, so I only used IT at work.

Sunday, January 23, 2005
Today is my last day writing in this logbook. After more than twelve hours of sleep I feel a little tired … he he … that’s today’s youth for you :) I went to my grandmother’s birthday, and you can guess how much IT she has in her apartment … he he … Just as much as almost any other old-age pensioner … he he 😊 Hmm, but this evening I watched a couple of movies and now I’m trying to upload this OneNote … It is more difficult than I imagined …

From March 15-17 and 29-30, 2005, I shadowed Michael at school. The following descriptions are translated into English from my field notes from March 15 and 16:
Tuesday, March 15, 2005
Today is a project day in Spanish, a subject Michael has selected. The class is going to watch a Spanish movie “Strawberries and Chocolate”. After watching the movie the teacher hands the assignments to the students and tells them that they can find an essay on the Studynet about the movie. They are supposed to use the essay as background material for working on the written assignment. The written assignment must be handed in at the end of the day.

The teacher starts the movie on class video machine and television. Then she leaves the class to teach another class. Approximately halfway into the movie, the teacher returns briefly and leaves again.

While watching the movie several students are writing, sending, and reading text messages. After watching the movie the students find computers to work at. The teacher presented the assignments as either individual or collaborative – emphasizing not cooperative – group work. The emphasis was a reaction to Michael, who commented that they could just split the assignment between them. The teacher has not booked the IT-room, but the students rather quickly find out that the IT room is available, and the teacher unlocks the door.

Michael is working with Steve. They start on the computer in the classroom but they get an error message “the user has been deactivated”. Then they turn to a computer available in the IT room. Approximately twelve students are working in the IT room with Michael and Steve. The other half of the class has gone home. Recently, Messenger was added to the Studynet, and Michael and Steve – sitting next to each other, each at their own computer – swiftly add friends to their Messengers.

Michael: “It doesn’t sort like it usually does. Normally it sorts so that people on-line move to the top.” [Michael is referring to his home Messenger, the HBC Messenger is based on Live Communication Server and ‘behaves’ as well as appears different than the Messenger version he is accustomed to using].

Michael and Steve are using the digital dictionary and the spell check. Michael says that he does not understand why the spell check will not recognize words that are “just in a different tense”. Michael and Steve start working individually and then they engage in working collaboratively. Some students in the IT room have found Babelfish, a digital translator, and the students discuss whether using this kind of translator is a good idea.

One student: “We are just using the media available to us”

Michael tells the other students about a guy who used one of those translators and how it translated things entirely wrong. The school was set on fire became The school had burns.
The boys return to their work. Steve and Michael are engaged in conversation while Steve is looking up words in the dictionary, and Michael carries on an ongoing dialog with Steve about the translation of sentences.

They can leave when they have finished the assignment. The two boys, occupied by their cell phones, chat, Word, dictionary, papers, book, and computers, finish the translation and move on to the other questions about the movie in the assignment. The first part of the assignment was a translation exercise and the other questions are more focused on the content of the movie and how to describe it in Spanish. At approximately 1:00 PM, the other groups in the IT room seem to be breaking up. Steve and Michael save their document in Michael’s private documents on the Studynet and send the assignment to the teacher by e-mail (without Cc’ing Steve).

Michael comments: “A teacher like our Spanish teacher just leaves and sits somewhere. She doesn’t go around helping us. This is why nobody feels like doing the assignments!” Then the boys call it the day and go home.

Wednesday, March 16, 2005

Project day in sales and marketing. The groups are working in the IT room. I am shadowing the group Michael is associated with, which consists of three boys and two girls.

8:50 AM – The group meets in the class and walks to the IT room in another building. The teacher and the other students are already there.

Michael (addressing me): We work better in the afternoon when we are under pressure.
The group sits at three computers; the boys at the computers and the girls in the back.

Michael quickly checks his group’s status in the Gazelle game (8th round) and the other two boys log on to Messenger and add other students while checking the soccer news on the Internet.

Michael and Nicky add students to her Messenger. Michael is at the keyboard.

Michael: *Are we starting now? Are we ready to get started?*

Christina: *What are we supposed to do?*

Michael logs off and Christina (now sitting at the computer) logs on and enters the Studynet where they have saved the group’s previous work (approx. six lines) under Christina’s private documents.

They have to write a maximum of ten pages about *Smirnoff Ice Products*.

9:18 AM – Michael finds the description of the assignment and hands it to Christina (now sitting in the middle at the computer with Nicky, Michael and Adam next to her).

Nicky has found their book. Michael and the girls are talking about the different parts of the assignment. Michael logs on again. Adam is chatting and has logged on to www.diageo.com while taking part in the group discussions about the target group.

Michael finds www.diageo.com too, and he finds a variety of information they can use. He is talking to Nicky about the information.

9:25 AM – The group has written a half of a page with 1½ spaces between the lines. They have a title and two paragraphs or approximately seven lines of writing.

Michael is yawning and comments: *You’ve written more than us* [referring to me]. In the classroom, Michael told me that the first and last class are always the worst.

Steve is now sitting with Adam at the computer furthest to the right. They appear to be focused on chatting on Messenger.

Michael and the girls are discussing several aspects of the assignment, i.e. quality and characteristics.

9:30 AM – Michael finds http://landingpage2.smirnoff.com, checks Messenger and adds a few more students. On the way to the IT room he told me that it really annoys him that they cannot contact other Messenger users [outside school].
9:33 AM – Michael is searching and the two girls are now sitting with Adam, who is on the same homepage as Michael. They talk about taste testing, bottle deposits, packaging, form, whether it is easy to hold, elegant, and that the labels are readable.

Humor is a steady ingredient in their work.

Christina: The bottle is formed like ...

Michael: Like bottles are formed… [smiling]. He moves on to check McDNet.

Christina: Should we write that there are many varieties of flavor?

Michael checks www.smirnoff.com

Christina: What should we write? I have written “quality control”...

Michael: You can write about the price. He finds a sound clip and plays it briefly.

Christina is writing. Nicky was gone but now enters the IT room again. She comments: No, the price can’t be expensive, but it can be high.

9:39 AM – Michael is now occupied with Messenger again. Finds “Status” and finds out that he cannot change his name: Look, it can’t be altered [clearly disappointed]. During a conversation, Michael told me that he is annoyed by his name and e-mail address on the Studynet: Who wants to have that on their card? Each student has their initials and birthdate.

The girls are talking about prices: 15 or 30 kroner. Different prices for different places.

Christina: Price and marketing strategy and elasticity. Did we write about service?

Michael is still investigating Messenger: Service, ohh, that’s what I was doing. He then returns to the video clip.

Adam is visiting Trendsales’ homepage. He is searching for something with Steve. The girls and Michael are discussing whether it is legal to advertise or if it is only possible to use a sponsor spot. Beer… that isn’t booze is it? Have you ever seen a Smirnoff commercial at home? It is only at the movies … We are talking about Smirnoff Ice and not Bacardi.

Michael has found a service on the Internet.

Nicky: That isn’t in Denmark is it? Then we can’t use it.

Michael: But then we can write that in other countries …

The girls have become engaged in a conversation about where to find ads. At the bus stop.
Nicky: *And in newspapers and the like.*

Christina: *What are they being called? We agree that magazines have the most ads, right?*

Nicky is looking to see if she has a magazine in her bag. She finds the magazine *Woman.*

Christina: *Promotion ... that’s the way one sells one’s product right? ... There’s a difference in the ways a product is sold, right?*

9:49 AM – Michael quickly checks the manager logbook on McDNet while the girls are looking in the book and searching for variations of promotion forms. Michael and Nicky leaf through the magazine. They are on the lookout for ads but they do not find any.

Michael (pointing at the screen): *Look, experience ... Smirnoff experience ...*

The girls are talking about the girls who give away merchandise. Nicky was one of those girls when she was under eighteen. It was located kind of far away and she had to pay for transportation.

Christina: *Look at this* [reads what she has been writing aloud]. Michael, Nicky and Christina are debating while looking in the book.


Nicky: *Why are you looking at Bacardi?*

Michael: *I just wanted to see. Bacardi has more ads.*

Nicky: *I have a Bacardi hat and t-shirt.*

Michael is calculating and figures out what a Bacardi refrigerator would cost in Bacardi bottles. Translating from German to Danish currency using the computer calculator, he quickly finds out that it would cost 2,000 kroner; the rest is for the bottles.

Michael: *Maybe that’s not so expensive?* Then he checks out the Bacardi store.

In the meantime, Christina has written almost one and a half pages.

Michael: *So ... now we don’t feel like writing anymore.* [addressing Steve and Adam]: Can we see what you’ve written? Adam opens Word.
Appendix

Michael finds www.tuborg.dk: Have you turned eighteen? Then he finds the Tuborg shop and looks for a refrigerator.

Nicky: A knitted Carlsberg cap, who wants that?

Michael: Tuborg mini fridge ... ahh, how corny. It can hold eight beer cans. It costs 700 kroner, which means I would rather have the other one.

Nicky: Yes, or maybe paint Tuborg on a regular refrigerator ...

Christina: Nicky and I have written nearly two pages.

Michael: I have also participated in writing these pages.

Christina [addressing Adam in reply to a question]: You would know if you would have read the assignment.

Christina [addressing Michael]: Did you find anything about service?

Michael: Yes I have. You want to hear it?

The girls: Yes ... in a moment ... we aren’t ready ...

Michael: We also need a cover page [has found a mini fridge that costs 1,000 kroner]. I could use that in my room. It holds eighteen cans. I don’t drink eighteen cans.

The girls are delegating a work task to Steve and Adam: page 243.

Michael [explaining]: We could write that the other countries have parties and concerts. Christina is writing. Nicky is sending a text message.

10:07 AM Michael is making the cover page.

Nicky and Christina: What do they call these ... services?

Michael: What do they call those parties?

Nicky: Those other countries ... what are they? Belgium and?

Michael: It says here ... where did I find it? It was on www.Smirnoff.com ... I think it was in the US. It was in Miami ...

Nicky: And other places.

Michael: Mostly in Miami ... look ... Smirnoff experience ... Look here in Miami, Miami, Miami ... only ... It is was in March.
Appendix

10:10 AM – Steve and Adam are drawing (so far they have been drawing a circle). The girls are commenting on Christian’s work (he is drawing).

Nicky: *Why don’t you copy it so that they will be the same?*

Adam: *Good idea.*

Music in the background: *I wish to God you would stay ...*

Michael is making the cover page. He is writing their names and the layout seems to be in place. Nicky and Michael, who are engaged in a conversation about the cover page, agree that maybe it is time to print a trial page. Christina is writing.

Michael (addressing me): *Do you know how to make your own frames? I know it can be done*

Unfortunately I cannot assist Michael, so he starts trying … *What about the Help function?* Together we try to figure it out. *Add frames ...* It is difficult when you do not exactly know what Michael is looking for.

Michael: Let’s drop the frames.

10:18 AM – Steve and Adam are drawing a model from the book.

Christina: *What’s it called when they serve it in a Smirnoff glass? Instead of, for example, a bottle. Is it original?*

Michael: *In an advertising glass?*

Christina: *In a glass with …*

Nicky: *Logo.*

Christina continues writing while simultaneously discussing with Nicky and Michael … *They do not sell directly?*

Nicky: *No, I believe they have wholesale dealers.*

10:21 AM – Michael is still working on the cover page.

Nicky (addressing the boys): *Then go to PowerPoint and make an arrow. It is much easier …*

Steve: *We better save this.*

The girls and Michael are making a header in the document. The boys are copying their model into PowerPoint.
Appendix

10:23 AM – The teacher, Brian, is still present.

Michael is working on the layout of the cover page. He has found pictures on the Internet and he has written the text “Assignment done by” followed by their names.

10:24 AM – The boys have made arrows between the circles in the model, and they have colored the circles. The girls are searching for the passport office opening hours, using Jubii’s search engine. They are going on a study tour. The assignment must be finished and handed in by April first.

Nicky: But spring break is in between so we won’t be able to work on it.

They print the cover page and decide that it is not useable. They close it without saving it.

Christina: I’ll make the cover page

10:30 AM – Christina has found the passport office homepage and comments: We need to get there before 2:00 PM.

10:32 AM – They are making the layout. It seems that the students are breaking up. Some students are eating and others are leaving the IT room.

Michael and the girls are still working. They are reading what they have written so far.

Christina: Now we have to figure out what else to include.

Michael: I have looked this up.

Christina (addressing Steve): You can do this one (pointing at a model in the book). (adressing the others) He has to do something.

Nicky and Christina: It needs the right colors, Steve.

Christina: We’re basing it on the entire book.

They agree that Michael is going to do the writing. Nicky sends a text message. Michael starts writing: Stuff to include in the assignment. Outline ...

The students are making jokes while Nicky is sending a text message and Steve is making the model.

Michael and Steve are discussing whether Steve’s model looks egg-shaped. It looks a little crooked. It is totally crooked.

Michael is writing.

10:40 AM – Nicky and Steve: *That’s nice. Could you make the green more like the real green?*

Michael gets another chair and sighs blissfully: *Ahhh.*

Nicky and Steve are making the model while Christina and Michael are doing the outline.

Adam has finished making his model and small talks with another group of boys.

Christina: *Maybe you can write … page 106, then? Come on. We just have to with these things, and then we will be done.*

Michael (laughing): *Then we won’t be done by today.*

They have seven items on the list. Christina and Michael now discuss their order. Adam has started doing a different model.

Michael (addressing me): *Isn’t it boring?*

I comment that I find it really interesting to follow their work.

Michael (clearly ironic): *We are incredibly efficient.*

I say that I do find them to be efficient.

Christina is picking up a print of Adam’s first model, and they are laughing about the effort they have put into making the colors fit while the print comes out in gray nuances.

Christina: *Where’s Brian?*

Christina asks another group. She is told that Brian has left, and then continues working. The noise level in the room is getting noticeably high.

10:50 AM – Michael wants to go to the cafeteria and asks if I will stay and watch the computer [a laptop in his bag].

Michael: *What is it called? A daughter company? A sister company?* [referring the term ‘subsidiary’]. *I guess it depends on the size.*

Michael and the two girls leave for the cafeteria. On the way out I can hear them talking about the length of the assignment.

Steve logs on to the Studynet. Adam continues working on the model.
Appendix

11:00 AM – The groups are gathered and have started working again [in between working they drink pop, chocolate milk, and eat hot dogs, sandwiches and baguettes]

Nicky is eating and reading *Woman*. Christina and Michael are working on the content, and Steve has begun writing text for the model while Adam is still working on the new model.

Christina: *Wouww … Isn’t it incredibly hot in here?*

11:08 AM – Steve is checking homepages irrelevant to the assignment. Michael finds Diageo\(^{229}\) on the Internet.

Michael: *Did anyone see the last episode of ‘Friends’ last night?*

Several students comment and briefly join in on a discussion about quality television. Steve is reading the Danish online newspaper *Ekstrabladet*, and Michael, Steve and a third boy are reading an article about the cannibal who received a lifetime prison sentence.

Christina: *We have to do the hard work.*

Michael: *We always have to do the hard work.*

Christina: *Yeah.*

Michael and Christina continue working. They have been writing headings like “Things that …” And now they are working with a point of departure in these.

Adam: *I could maybe do the SWOT analysis? What do you want me to do?* (addressing Christina)

Michael is chatting. Michael and Steve seem to have an ongoing competition about who has the most on-line [referring to the amount of friends one has on Messenger].

Michael and Christina are talking about how they miss Brian right now.

Christina: *We always have the teachers that go missing.*

Michael and Christina walking around: *Do you know where we can find Brian?*

Someone: *No …*

Appendix

11:19 AM – Michael and Christina enter the IT room again. They are engaged in a conversation about product development. They address Adam and invite him to join in on the discussion.

Christina: I really don’t know if what we have been doing is right.

Smalltalk about candy floss and whether it is in fact possible to eat it without getting it all over the mouth and on all ten fingers.

11:25 AM – Michael and Christina are looking in the book and relating theory to Smirnoff Ice. They are discussing. Adam has left and Steve, who bought pizza, is eating while reading articles on the online newspaper Ekstrabladet.dk.

Christina is writing and Michael is making comments: Then we can erase the competition strategy.

Michael (asking Steve): Are you guys done?

Steve: Not quite ... Nicky are you coming?

Nicky: Yes. She moves her chair towards Steve and starts reading what Steve has written. She sits at the computer and starts editing and adding.

Adam returns. Michael, Christina and the other students are talking about funny homepages like www.haribo.com.

11:30 AM – Brian is back and informs the students that they will also be able to spend the hours with another teacher on Friday working on the assignments.

Christine rolls her chair to another group engaged in a conversation about taste samples.

Michael has found Haribo’s homepage.

Christina and Michael return to the “market position”. Adam, Christina and Michael are discussing niche and market. Adam is referring to the materials.

Nicky: What is demography?

Steve: I don’t think we are going to use that.

Nicky asks Christina: Does it have to do with population and stuff? Then she goes back to working with Steve.

11:36 AM – Michael has found a Martini homepage.

Brian walks by and asks if anyone needs assistance. Christina asks what they are supposed to look at. Brian makes suggestions. Michael, Steve and Nicky are
discussing where the stores get the products from. Christina, Michael and Brian discuss target groups ... Brian provides supervision on the items the group has been working on. He suggests that they can make an analysis and refers to articles from the newspaper *Børsen*.

11:40 AM – Brian moves on to the other groups.

Adam is looking at the online edition of the newspaper *BT.dk*. Nicky and Steve have nearly written a half a page. Christina has started a new Word document. Another boy, Bo, comes in and picks up Steve. Nicky returns to her magazine.

Christina is protesting loudly: *You can’t just leave with Bo. Then we can just erase your name from the assignment.*

Christina and Michael continue working. Adam’s still reading articles online – not apparently relevant to the assignment.

Christina and Michael are making a print and Michael leaves to get the papers from the printer.

11:45 AM – Michael is searching B&O on Google. Christina is making margins and doing other layout activities. Michael does not succeed in finding what he was looking for. He tries, among others, www.bogo.dk/com. Finally, he succeeds with www.bang-olufsen.com, where he finds his cell phone.

Michael: *This is when we realize that we have made it all wrong because we have been basing our work on a product and not the company.*

Michael hands the problem formulation on paper to Steve.

Christina: *Go to Børsen ... Brian, where is it?*

Brian: *Go to the article archive and write ’Smirnoff’.*

Nicky is sending a text message. Michael is reading an article.

12:07 PM – Michael is reading articles, Christina is writing. Steve is sitting cross-legged in a chair next to Adam, who has now been playing cards on the computer for a while. At the moment the group has written approximately two pages.

Michael (addressing me): *Can I see what you are writing?*

I show Michael what I am writing. Nicky wants to see it as well. I show them, and they laugh a bit. I explain that I am trying to describe how they work in detail, that I am not going to show their teachers and that I will change their names and otherwise do my best to anonymize everything in the final thesis.
Christina: *Halloo ... I really don’t feel like being the only one doing the writing and working. Steve is just fooling around. Adam is playing cards, and Michael and Nicky are just surfing. I don’t want to be the only one doing something.*

After a little laughing among the group members, Nicky quickly moves to the computer and continues working on her and Steve’s document. Michael shifts his attention to the computer and Adam closes the card game and returns to the PowerPoint with the unfinished model once again.

Christina is looking at the old papers. The group is now working on a new document with a different, report-like layout (paragraphs with a lot of text, before they were many brief paragraphs). The new document is labeled ‘Smirnoff’ (and refers to the company instead of a product).

Christina starts reading articles. Michael prints an article and Steve still seems a little unfocused. Christina is waiting for Adam to finish and decides to make the cover page.

Michael is reading. Nicky is adjusting the model.

Christina: *This is kind of an odd project day, being given one day to work on it when we don’t have to hand it in until a week from now.*

Christina (addressing Michael): *Wouww, should we choose this?* (referring to a WordArt text).

Michael: *Yes ...* (both laughing).

Christina: *Michael will you please help me? We need to find out what font to use.*

Michael is looking and suggests that they just choose one. There are so many to choose from. Nicky is sending a text message and still doing the model. Adam is making a model for a product. Steve is on his cell.

Michael is reading an article: *In all the articles it says that it went well to begin with, and then it stagnated. Are we putting the articles in the appendix?*

Christina: *No, we just need the information.*

Michael checks his Messenger

12:27 PM – Christina is laughing; she has found a picture of a girl with a bicycle helmet with a Smirnoff bottle on it … and another less proper picture …

Brian: *Does anyone want to fill out a questionnaire about grades?* Several girls answer eagerly “*Yes!*”
Nicky is answering a questionnaire. Christina and Michael are printing their new suggestion for a cover page. This time the logo is as invisible as in Michael’s earlier draft. They are looking for new pictures.

12:31 PM – Michael is reading an article. Christina has found a picture with a man with a bare torso and a Smirnoff bottle.

12:37 PM – Nicky is still answering the questionnaire.

Michael and Christina are looking at the Statistics Denmark for popular names. They are laughing when they discover how popular the name Steve has been.

Steve: *Ohh, look how popular my name has been.* They are laughing and now a couple of other boys from the class are joining in. “Åge”, “Boye”, “Hassan”, “Mohammed”, “Jesus” and so on.

12:48 PM – A lot of students are laughing hard as they discover that somebody has the name “Hemming”.

12:56 PM – Christina: *Well, what were we looking for?*

Michael is trying remote support through Messenger [a possibility I have told him about]. It is working.

Michael (addressing me): It’s really smart; just a shame (with a smile) that the other person has to accept, then you can’t just go and take control over their screen.

The group agrees to call it a day. They will continue working on Friday when they have two hours. They can study at home until Friday.

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Statistics Denmark: www.dst.dk
This thesis takes a Science and Technology Studies and Actor-Network-Theory approach to researching the mergers of a knowledge sharing system and a Danish business college. The thesis builds on a long-term praxiographic study and presents ways to understand the enactments of the Studynet and HBC as well as their interobjectively enacted relationships. The concept of movements rather than changes is introduced to emphasize that enacting relationships between education and ICTs involve complex and manifolded processes of (dis-)engagement work. Adding STS/ANT to e-learning research and moving focus from effects of and with ICTs to ICTs and e-learning as effects is new. Only recently have educational researchers in Denmark begun to gain/articulate inspiration from and engagements with STS/ANT, also bringing ANT into e-learning science may be viewed as quite a new move.