PARTICIPATION IN A BOUNDLESS ACTIVITY

Computer-mediated communication in Swedish higher education

JIMMY JALDEMARK

Pedagogiska institutionen
UMEÅ UNIVERSITET
Nr 93 • 2010
© Jimmy Jaldemark, 2010

Participation in a boundless activity: Computer-mediated communication in Swedish higher education (doctoral dissertation)

Department of Education, Umeå University, Sweden

Cover design: Elina Jaldemark, Jimmy Jaldemark, Marcus Sundgren

Printed by: Hemströms Tryckeri, Härnösand, December 2009


ISSN 0281-6768

Abstract

The general purpose of this thesis is to understand how participation in the activity of education relates to communication and tools. This purpose unfolds by drawing on possible conceivable consequences. In the fulfilment of this purpose communication, education, participation, and tools are analytically linked by a common denominator: human action. The commentary text expounds on these links, while the four included papers illustrate how these links operate in educational settings. The general purpose serves to frame a narrower purpose: a discussion of participation through computer-mediated communication in online settings of Swedish higher education. The theoretical departure derives from a transactional approach that embraces human action as an inseparable aspect of a dynamic whole, here defined as the activity of education. This activity is discussed in terms of its cultural, ecological, historical, and social aspects. This theoretical departure embraces ideas largely taken from ecological, pragmatic and sociocultural perspectives of human action. The papers include analyses of, variously, empirical material taken from interviews with students, online exchanges of utterances, syllabuses, and study-guides. Two of the papers are literature reviews. The findings indicate that participation in education is a complex boundless phenomenon that is best understood as a dynamic whole. In this whole, participation in education is culturally, ecologically, historically, and socially transformed by actions, agents, communication, tools, and the setting. In this thesis, concepts such as computer-mediated communication, communicative genres, dialogical intersections, and educational settings are utilised to reach a dynamic understanding. The dynamics of these findings, therefore, are a challenge to all dualistic conceptualisations of education, such as those building on the idea of learners operating in learning environments. Particularly, these findings challenge operationalisations of education that rely on computer-mediated communication and which build on the idea of so-called online learning environments. A more coherent understanding of participation in education is possible if educational research and design builds on a non-dualistic conceptualisation that includes the idea of participation being performed in a boundless activity.

Keywords: action theory, activity, communication, computer-mediated communication, distance education, educational settings, higher education, online courses, online education, participation, tools
ACKNOWLEDGEMENTS

Writing a thesis is maybe like composing and performing music, it is sometimes a process of flow. At other times it is just hard work! As in any creative activity such as music, good research also includes important keynotes, strong themes, a clear structure and a solid performance! However, friends and colleagues who knows me well, also know that music is a source of inspiration for me. This inspiration starts with my wake-up call, a wonderful instrumental piece called “Golden dawn” (Malmsteen, 1992) performed on the classical Spanish guitar.

The sound of music is a constant feature in my office. Therefore, this thesis would not be the same without all the music that went through my ears during all these years of writing! Similarly, belonging to different communities is part of being a human being. During the years in these communities, I have met people that have made an impact on me and my writing. However, a few words from some great songs came to my mind when writing these pages of acknowledgement. These words are dedicated to these great people, without their influence this thesis wouldn’t be the same.

First of all I want to honour my supervisors by singing “thank you for the music, for giving it to me” (Andersson & Ulvaeus, 1977). During the early years Jarl Backman, and later Agneta Hult and David Hamilton. All three of you have contributed to the development of my thinking. David, a special thanks for being the greatest of inspiring academic sources during these years; and for being important for my development ever since my courses at master’s level. Your academic capacity and your never-ending efforts to push me one step further were a gift from above to me. I wish you, Agneta and Jarl all the best.

During these years I have been part of an excellent community of doctoral students at Umeå University. Together we were learning to fly. You all know that “there’s no sensation to compare with this … can’t keep my eyes from the circling skies” (Gilmour, Moore, Ezrin, & Carin, 1987). Some of you have finished your thesis while a few of you still have a few steps left before entering the community of PhDs. Gun Berglund, Erika Björklund, Ann-Louise Bäcktorp, Inger Eliasson, Josef Fahlen, Karin Franzén, Ola J. Lindberg, Sandra Morén, Anders D. Olofsson, Kim Wickman, and Ulrika Widding, thank you.

Amongst these colleagues a special thanks goes to my co-writers Ola and Anders. Your brilliant brains definitely had an impact on my thinking. Unlike many other doctoral students we also belonged to a research group led by Jarl Backman. This group discussed questions related to learning and ICT in higher
education. The discussions within that group also embraced important comments from senior researchers such as Jörgen From and Carina Holmgren.

Ove Jobring, three good reasons to say cheers to you; first you were my teacher in my final PhD-course where you introduced me to the world of communities. Second and third you were involved in the publication of both the first and second papers of this thesis. The first one appeared in your trilogy of online learning communities. The second paper is a result of an invitation from you and Roger Säljö to participate in the LearnIT-seminar “Online learning communities in context”. In that particular seminar, I also had the pleasure of discussing my work with world-class scholars in the field of online learning communities. Particularly important comments on my paper were given by my discussant Caroline Haythornwaite. Later, you also provided me with a few references for my commentary text. Apart from the comments from the above mentioned scholars, I also enjoyed discussing my work with Urban Carlén, John Cuthell, Vivian Hodgson, Piet Kommers, Elsebeth Korsgaard Sörensen, and Christina Preston. A “toast to tomorrow and one to days long ago” (Blackmore & Night, 2008) to all of you. This toast also goes to: Mohamed Chaib, Stefan Hrastinski, Christina Keller, Karin Levinsen, Bernard Scott, and Ann-Katrin Svensson. I had the opportunity to discuss my work with you at conferences and workshops. I have particularly enjoyed the meeting of minds together with Stefan.

I am also grateful for the students and teachers (particularly Gunnel and Martin) who participated in my studies. Thanks for letting me get inside your world. Without your participation this thesis wouldn’t have been written.

A special thanks to Cecilia Hamilton at SAM-biblioteket, Härnösand. Such professional support from a librarian is invaluable for a doctoral student.

In the recent years I have had the opportunity to attend the meetings of the FOLI-network (Forskning Om Lärande och Interaktion). This network was a highly skilled network with scholars from different Swedish universities. Special thanks to Lisbeth Åberg-Bengtsson, Roger Säljö, and Per-Olof Wickman for letting me into this excellent network. At my first appearance I presented a rough draft of my commentary text. The task of commenting this draft was given to my discussants Torgny Ottosson and Patrik Lilja. They and other participants at that meeting, such as Anders Jakobsson and Johan Öhman, contributed invaluable comments that definitely improved my commentary text. Particular thanks go to Johan for his comments on Dewey.

Writing a thesis is also a matter of life and death. In line with the view of human action presented in this thesis, writing is inseparable from my life-situation. During these years of study/research I have experienced the joy of becoming a father and also the sorrow of losing people who were close to me. These moments of life have been shared with some great people. Unfortunately,
I can’t mention everyone! However, I must particularly mention a few of these angels: Sofia Eriksson-Bergström, Ann-Charlotte Eklund, Ulrika Ekvall, Gunnel Fredriksson, Mattias and Emilia Huss, Anders Lindqvist, Olle Nyberg, Jesper Ordell, Maria and Mikael Rasmusson, Maria Styf, Hans Wiklund. I saw “the hope in your eyes … where would I be without you” (Huff, Brignardello, & Vallance, 1992). When I needed it most you were there for me.

Finally, this thesis is dedicated to my family, particularly my angels Elina and Moa. Together we dance and sing along with Alfred, the farm-hand in 'Emil i Lönneberga', “I’m just a poor farm-hand, but I’m living my life. The days roll by as I work away” (Lindgren & Riedel, 1971).

Härnösand summer 2009
CONTENTS

PROLOGUE ................................................................................................................. 11

I. INTRODUCTION ............................................................................................................ 13
Purpose .......................................................................................................................... 15

II. GENERAL RESEARCH APPROACH ........................................................................... 17
Action ............................................................................................................................. 17
   Human action and the environment ........................................................................... 17
   Interaction and transaction ....................................................................................... 19
   Methodological approach to human action ............................................................... 20
Settings ......................................................................................................................... 23
   From Ecology to Setting .......................................................................................... 24
   From Culture to Setting .......................................................................................... 26
   Reconciling Ecological and Sociocultural Perspectives ............................................ 31
Tools ............................................................................................................................... 32
   Mediation: Linking tools with other aspects of human action .................................. 32
   Categorisation of tools ............................................................................................ 33
   Tool and agent ......................................................................................................... 34
Communication .............................................................................................................. 35
   Communication: Utterances and settings .................................................................. 35
   The constitution and transmission of communication .......................................... 36
   Communication and tools ....................................................................................... 39
Educational settings ...................................................................................................... 43

III. EDUCATIONAL SETTINGS IN HIGHER EDUCATION ............................................ 45
Higher education goes online: From correspondence teaching to online settings ... 45
Swedish higher education goes online ......................................................................... 47
   The political trajectory ............................................................................................ 47
   The research trajectory I: from distance ................................................................. 50
The research trajectory II: … to online................................................................. 51

Communication, participation, and tools in Swedish educational settings ...... 56

IV. SUMMARIES OF PAPERS ............................................................................... 59

Introductory reading to the papers.................................................................... 59

Paper I: Ett deltagande för alla? En kritisk diskussion .................................. 60

Paper II: Changes within the practice of higher education: Participating in 
educational communication through distance settings.................................. 61

Paper III: Sharing the distance or a distance shared: Social and individual 
aspects of participation in ICT-supported distance-based teacher education.... 62

Paper IV: Participation and genres of communication in online settings of 
higher education ................................................................................................. 63

V. EPILOGUE ........................................................................................................ 65

In retrospect: The heart of the thesis................................................................. 65

Education and environment revisited ............................................................... 66

The difference between tools and learning environment................................. 66

Prospects for designing and researching boundless participation in the activity 
of education ....................................................................................................... 68

Consequences of boundless participation in the activity of education ............. 73

REFERENCES ....................................................................................................... 75
My interest in educational phenomena such as participation and communication began when I was a student of higher education in the 1990s. During these years, I started to explore issues related to both communication and participation in education (e.g., Jaldemark, 1998; Jaldemark & Thyberg, 1994). During 1994, I had the idea of developing an educational magazine where pupils’ questions could be answered by experts from Swedish universities. The magazine was published on the Internet and was designed to foster communication and, at the same time, push childrens’ questioning to a higher level. Later, other online resources aimed at pupils, teacher training students and teachers were added to the magazine (Jaldemark & Ivancic, 1996; Åstrand, 2001). By 1997, my interests had been extended to the use of computers in higher education. During a couple of years, I taught at a teacher training university college. These experiences of teaching and leading educational development projects led me to reflect on the general role that communication plays in educational settings. This study is an extended version of my reflections.

Specifically, this study of educational phenomena such as communication and the tools related to participation in education focuses on higher education in Sweden. Overall, ideas are drawn from four areas: communication theory, ecological theory, pragmatism, and sociocultural theory.

This thesis consists of four papers framed by an extended theoretical introduction and a subsequent discussion of these papers. Of the papers, three have been published internationally (Jaldemark, 2008a, 2008b; Jaldemark, Lindberg, & Olofsson, 2005b) and one nationally (Jaldemark, 2005a). Two of these papers are book-chapters, one of these chapters is written together with other researchers, and the other two papers are internationally published journal-papers. All four papers have been through peer review-processes.

The first chapter introduces the general idea of this thesis. It concludes with a presentation of the purpose of the thesis and the general educational questions it embraces.

---

1 Researchers refer to this psychological perspective as sociocultural, cultural-historical, sociohistorical, or sociocultural-historical. For the sake of this thesis, the term sociocultural is used. The concept activity is one of the most important concepts in this perspective. Scholars in this tradition continue to examine and extend on the insights of early 20th century scholars such as Bakhtin, Vygotsky, Leont’ev, and Luria.
The second chapter deals with the general research approach. It starts with a discussion of a general theory of human action. Thereafter this theoretical foundation is unfolded in discussions of the concepts: settings, tools, and communication. Finally, this chapter closes with a general discussion of the notion of educational settings.

The third chapter comprises a discussion of educational settings in higher education. It starts with an overview of the international narrative on how settings in higher education have gone online. Thereafter follows an overview of such a development within Swedish higher education. These overviews include historical analyses of the development of educational settings within the practice of higher education. The discussion tracks political as well as research trajectories where agents have used computer-mediated communication.

The fourth chapter comprises the four published papers. This chapter starts with a summary of the papers and a guide to the reading of these papers. Thereafter the four papers are included as free-standing pieces. They illustrate the application of the general research approach, including the key concepts of the thesis. They focus on communication mediated by computer-based tools in educational settings of higher education.

The fifth and last chapter is an epilogue that summarises the thesis by discussing general findings and their consequences for understanding how participation in higher education relates to computer-mediated communication and educational settings.
I. INTRODUCTION

From the early 1990s participation has become a fashionable concept in educational discussions. It was popularised, for instance, in the form of Lave and Wenger’s ‘Situated learning: Legitimate peripheral participation’ (1991) and Sfard’s influential discussion of models of learning (1998). The latter discussion embraced attention to participation in activities. These activities are considered as inseparable from participation in “the context within which they take place” (p. 6). In turn, the idea of participation has been linked to other areas of thought, notably writings on human communication and the role that tools play in fostering communication. This last field of inquiry also embraces the field of information and communication technology (ICT) and figures prominently in the associated field of educational design.

This thesis combines these interests and comprises an analysis of how ideas about communication, participation, and tools might come together in the pursuit of learning. Within the last two decades these ideas have been brought together in the idea of learning environments. This gathering of ideas marks what Jonassen and Land claim a “a new age in learning theory” (2000a, p. iv). In this age many educational discussions give attention to these ideas. This is evident for example in data-bases such as Google Scholar. A search, performed in 2009, of ‘learning environment’ combined with ‘education’, returned 282 000 hits of scientific publications in social science, while a restricted search adding the concept ‘design’ returned 92 000 hits.

Among these publications Reigeluth (1999a) emphasises the above mentioned gathering of ideas and their link to learning and continues by claiming that attention to “the nature of the learning environment” (Reigeluth, 1999b, p. 8) is a pre-condition in any design for learning. Moreno and Mayer (2007) extend this idea of designing for learning by discussing participation in learning environments. They emphasises human action by defining that what happens in these learning environments “depends on the actions of the learner. In short, the defining feature of interactivity is responsiveness to the learner’s action during learning” (p. 310).

Merriënboer and Kirschner (2007) also discuss educational design issues such as participation in computer-based learning environments. They underline the important link between tools and learning environments by claiming that “the heart of the learning environment will typically consist of a computer simulation” (p. 212). Other studies linked to participation in learning environments emphasise Internet-embedded tools (e.g., Anderson,
2009; Mahdizadeh, Biemans, & Mulder, 2008; Rhode, 2009; van Raaij & Schepers, 2008). Such tools are used “for communication and disseminating information with the aim of enhancing learning” (Wells, de Lange, & Fieger, 2008, p. 504).

A conclusion drawn from these publications is that attached to the concept of learning environment is the possibility of designing for learning in general and, in particular, of achieving this by using different technological features to facilitate communication. Often the design of learning environments highlights the role of technology in facilitating communication and learning. This rationale depends on how to best “use new technologies to support education” (Laurillard, 2008, p. 139). In these discussions the concept learning environment has been applied to situations and locations where learning is supposed to occur.

Nevertheless, behind the idea of designing for learning lies the assumption that a change in the learning environment leads to changes in learning. Further, it embraces a fundamental assumption that well-designed learning environments necessarily lead to good learning. Is it axiomatic, however, that these well-designed learning environments lead to good learning? This kind of logic is problematic since it emphasises a one-way causal relationship between learning and learning environments. Within this link lies a deterministic and behaviouristic notion that subordinates learning to the power and influence of the learning environment.

However, what relevance has this reasoning to understanding other aspects of educational practice? For example how could a dualistic conceptualisation of participation in education that embraces the concept of learning environment help us to understand the relation between communication and learning? That conceptualisation is problematic insofar as it subordinates communication to the concept of learning environment. If the learning environment is superior to communication as well as learning, phenomena outside the learning environment are de-emphasised. This gives a diminished understanding of participation in educational communication, a shortcoming that this thesis seeks to redress.

The extent of the association between education and learning environment in scientific publications shows that the relation between learning environment and education is problematic. However, does it mean that learning environment is a suitable high-level concept for understanding the phenomena of participation in education? This thesis suggests that education is far more complex than the management of learning environments. Indeed, it challenges attempts to use the concept of learning environment as a basis for understanding educational phenomena. To grasp the complexity, this thesis addresses a foundational question: the relation between participation in
education and the environment. Before turning to that question a brief overview of concepts related to this question will be unfolded.

In this thesis, education is an activity that relates human beings to motives, actions, settings, and tools. Agents such as students and teachers participate in this activity with the motive of learning and teaching about different aspects of reality. Participation in this activity embraces the communication of human experience. However, activities such as education operate in different settings. While this thesis elaborates on educational issues, the proper term used in this thesis for these settings is **educational settings**. In educational settings agents communicate, for instance, on issues related to both the content of curriculum and social life. To participate in such actions, agents use tools.

The thesis focuses on educational settings in formal education, particularly in higher education. Educational settings where students and teachers communicate with the help of computer-based tools provide illustrations. Overall, this thesis offers the concept of educational settings as an answer to the challenge of conceptualisations of education that seek to build on the idea of learning environments. The idea of educational settings is argued as a more suitable concept linked to education. The main reason for this is that the conceptualisation of participation in education made in this thesis relies on concepts that identify human beings as inseparable from their actions and their activities. Nevertheless, while the idea of learning environment is identified as a problematic concept, ideas about the environment remains important for this thesis. To understand education as an activity embracing actions performed in educational settings, there is a need to understand the relation between these actions and the surrounding environment. This understanding depends on particular views of the world; in other words, an outlook on human action. However, there are different views of how to understand human action. Depending on this understanding of human action, different answers will be offered to key questions relating to the phenomena of education.

**Purpose**

The general purpose of this thesis is to understand how participation in the activity of education relates to communication and tools. The thesis unfolds this purpose and draws on possible conceivable consequences by studying communication, participation and tools in educational settings. In the fulfilment of this purpose communication, education, participation, and tools

---

2 Here the concept environment is used in a general sense, for example in discussions about man and the world or the role of the environment in participation in educational settings. Therefore, it has nothing to do with either learning about the environment or political connotations attached to this concept, such as fighting against the use of fossilised carbon-fuel or being an environmentalist such as members of organisations such as Greenpeace.
are analytically linked by a common denominator: human action. The commentary text expounds on these links, while the included papers illustrate how these links operates in educational settings.

The general discussion of education serves as a frame for a narrower purpose: a discussion of participation through computer-mediated communication in online settings of Swedish higher education. The key questions related to this thesis are as follows:

- How can the activity of education be conceptualised in terms of educational settings?
- How does participation relate to the activity of education?
- How do tools relate to the activity of education?
- How does communication relate to the activity of education?
II. GENERAL RESEARCH APPROACH

Action
The introduction to this thesis emphasised that an understanding of educational phenomena depends on how to conceptualise the relation between participation in education and the environment. This conceptualisation is based on particular views of how to understand human beings and their participation in the world. Expressed in other terms, educational phenomena are inseparable from fundamental theories of human action. This chapter elaborates on the issue of how a theory of human action operates as a common denominator underwriting the key concepts of this thesis. The following discussion elaborates on how man relates to the concept environment.

Human action and the environment
How the action of man is to be understood has been debated at least since the philosophical writings of Plato. It comprises how to relate the mind of man to the surrounding environment. Through history, it has embraced at least three different positions (Wartorfsky, 1979). The first two positions, idealism and empiricism, make dualistic claims about the relation of mind and the environment. They separate the mind from both the body and the surrounding environment. In other words, these two positions emphasise a perspective where human action is a product of man acting on a surrounding environment that is independent and external to the mind of man.

As an idealist, Plato emphasised the mind as the location where the real world exist. The environment outside is just a shadow world, a pale version of ideas that exist in the mind of man. The empiricist position, popularised by, among others, Francis Bacon in the 17th century, is that the environment consists of matter in motion. In this view, the mind is a separate mental world subject to the influence of external experiences. These dualist positions encountered critical remarks over their strong separation of mind, body and environment. Empiricists were criticised for reducing human beings to machines and idealists were criticised for ignoring the materiality of the world.

The third position rejects the dualism between mind and body or environment and mind. Instead, it embraces a dialectical and ecological view of the relation between mind and environment and therefore grounds its view of
human action as something that cannot be separated from its surroundings. Influenced, for instance, by the Darwinian theory of evolution (Darwin, 1859) and the dialectics of Hegel\(^3\) (e.g., 1821/1990) and Marx\(^4\) (e.g., 1867/1990), the mind of man together with the environment are regarded as a dynamic whole. Accordingly, this view of human action rejects the dualism of the earlier positions and emphasises the necessary relationship between man and the environment. This position is taken in this thesis. The following section elaborates this view further.

During the late 19th and the early 20th centuries, scholars from both the United States and Russia rejected the dualist view of man and the world (e.g., Bakhtin, 1935/1981; Dewey, 1916; James, 1909/2000; Vygotsky, 1934/1987). American pragmatists like Dewey (1859-1952) and James (1842-1910) focused on the actions of man. In 1909, James (1909/2000) claimed that the relations between man and the environment “are just as much matters of direct experience, neither more so or less so, than the things themselves” (p. 138). Further, James claimed that environments comprise inherent structures that man could discover by experience. These structures exist because a “directly apprehended universe needs, in short, no extraneous trans-empirical connective support, but possesses in its own right a concatenated or continuous structure” (p. 138).

Dewey (1916) criticised the empiricist dualist position of mind and the environment and claimed that it isolated people from each other and the communities in which they exist. In other words, there is no escape from either the physical or the social aspects of the environment. Human action occurs as part of this environment and is a condition for the emergence, in a human being, of “a mind of his own” (p. 344). Mind and the surrounding environment are inseparable and “the self achieves mind in the degree in which knowledge of things is incarnate in the life about him; the self is not a separate mind building up knowledge anew on its own account” (p. 344).

In Russia, Bakhtin (1895-1975) and Vygotsky (1896-1934) raised similar thoughts. These scholars built on the idea of dialectics discussed by Hegel (e.g., 1821/1990) and further developed by Marx (e.g., 1867/1990). Following Marx’s conclusions, they regarded “every historically developed social form as in fluid movement, and therefore takes into account its transient nature not less than its momentary existence” (Marx, 1867/1990, p. 11). They emphasised the social, cultural, and historical transformations that occur through human activity. Building on this dialectical and materialistic view of the world, they highlighted the link between man and the surrounding environment.

\(^3\) 1770-1831
\(^4\) 1818-1883
Writing in the 1930s, Vygotsky (1978, p. 60) claimed that “the influence of nature on man, asserts that man, in turn, affects nature and creates through his changes in nature new natural conditions for his existence”. Therefore, being part of the world is to live as part of the emerging cultural, historical, and social patterning of the world. In this view, thinking and language are inseparable from the culturally, historically, and socially transformed configuration of the surrounding environment (Vygotsky, 1934/1987).

Bakhtin discussed the relation between mind and the world in terms of humankind’s constant dialogue with the world. Humankinds’ understanding of the world intertwines with the responses in the dialogue. Together, understanding and response dialectically merge “and mutually condition each other; one is impossible without the other” (Bakhtin, 1935/1981, p. 282).

In short, this thesis follows these pioneers in assuming that human action is a direct and inseparable relation between man and the surrounding environment. This relation is dialectical and dialogical, linking cultural, ecological, historical, and social aspects of life on earth.

Interaction and transaction

But how does this dialectic operate? Beyond the initial perspectives offered by Dewey and James, more recent commentaries have made a distinction, which I have found valuable, between interaction and transaction. The concept interaction derives from the Newtonian laws of motion where “action and reaction are equal and opposite. The classical mechanics is such a system of interaction involving particles, boundaries, and laws of effects” (Dewey & Bentley, 1949/1960, p. 68). However, Dewey and Bentley also argue that such an interactional approach to human action “shatters the subjectmatter into fragments in advance of inquiry and thus destroys instead of furthering comprehensive observation for it” (Ibid., p. 68). In such approaches human action is a reaction to the preceding action. In other words, that approach retains a dualistic division of elements or variables, for example man – environment or mind – environment. To avoid a dualistic and fragmentised analysis of human action this thesis requires an alternative perspective, which is characterised by using ‘transactional observations’ which reach across time and space. These are historical and comprise “the right to see together, extensionally and durationally, much that is talked about conventionally as if it were composed of irreconcilable separates” (Dewey & Bentley, 1949/1960, p. 69).

Transactional approaches incorporate a wider view of human action. In these approaches “there are no separate elements … the whole is composed of inseparable aspects that simultaneously and conjointly define the whole” (Altman & Rogoff, 1991, p. 24). Furthermore, transactional approaches focus on situations which arise where actions, agents, and environment intersect. In these approaches understanding the patterning of human action includes
intersectional analysis of spatial and temporal aspects as well as processes of change.

By contrast, interactional approaches are committed to a narrow study of human action which takes no account of cultural, historical, social, or temporal conditions or motives. Understanding patterns of human action only needs to take into account the process of action and re-action. In other words, interactional approaches separate human action from environmental and situational aspects of the action. This separation is problematic as Dewey and Bentley (1949/1960, pp. 151-152) point out: “epistemologies that isolate two components, that set them up separately and then endeavor to put them together again, fail”. Accordingly, my view is that a dynamic understanding of human action needs a transactional approach which assumes that human beings are inseparable both from the actions they perform as well as from the environment in which such actions occur. Conceptually, this means that analysis of participation in education requires concepts that embrace this inseparability. In this thesis, activities, settings and tools are such concepts. These concepts underwrite the link between human action and features, such as the environment and technologies, linked to human action. The next section develops the idea of inseparability further by unfolding methodological consequences of the transactional approach to human action.

Methodological approach to human action

If human action is a non-dualist transactional process how could we study it? Transactional inquiry treats descriptions as tentative and preliminary. In these descriptions, adequate specification of the constituents is inseparable from the other constituents. Therefore, transactional observation and reporting of the world “develops the widening phases of knowledge” (Dewey & Bentley, 1949/1960, p. 122) and broadens understanding of human action. It accepts that human activity extends across time and space. This means that a thing is “in action, and ‘action’ is observable as thing, while all distinctions between things and action are taken as marking provisional stages of subjectmatter to be established through further inquiry” (Ibid., p. 123).

The approach emphasises a “moment of action rather than a separate process or entity that exists somehow in isolation” (Wertsch, 1998, p. 23). It embraces aspects such as communication, participation, and tools belonging to a whole, depending on each other for their very definition and meaning (Altman & Rogoff, 1991). Therefore, a transactional approach embraces observations of human action. Investigation of the action of communication, for instance, is

“connected with their thing-perceivings and manipulations, and which permits a full treatment, descriptive and functional, of the whole process,
inclusive of all its ‘contents,’ whether called ‘inners’ or ‘outers,’ in whatever way the advancing techniques of inquiry require” (Dewey & Bentley, 1949/1960, p. 123).

A consequence of this stance is that this thesis comprises a discussion of communication, participation, and tools as aspects of a whole. This whole is the activity of education and, in the performance of human action, these three phenomena are inseparable. Although the introductory chapters of the commentary text includes a general discussion of these phenomena of human action one by one, in practice they are inseparable. In the papers they are elaborated as intersectional phenomena linked to moments of action that embraces changes as well as spatial and temporal bounded aspects.

In paper one this figure of thought embraces discussing individual as well as structural aspects of human action in educational settings. Overall this paper then discusses possible consequences for online participation in these settings. The analysis, in the second paper, of changes in the practice of higher education underwrites the inseparability between human action and its surrounding environment by focusing on the link between the phenomena of participation, tools, and location. That paper develops an understanding how that link has changed over a period of two decades. To understand participation in distance-based higher education, the third paper embraces individual as well as social aspects of participation. Further, the paper deploys empirical material from students that had at least two years experience of online participation in educational settings. This selection criterion was used to ensure the empirical material included influences from historical aspects. The fourth paper deals with the complexity of discourse in education. To secure an understanding of this communication the study embraced aspects from the educational setting. Therefore, in addition to the transcripts of students’ and teachers’ communication, the analysis also comprised empirical material from steering policy documents such as study-guides and the syllabus.

Another consequence of observing the activity of education in terms of ‘moments of action’ is that the concepts used in the thesis seeks to address the inseparability of observed phenomena. This process is at least two-fold. First, it is about using concepts that grasp this inseparability. A suitable label for human beings in action is therefore agents, where the agent is the one who acts. That is also the reason why the discussion here focuses on the concept of tools instead of concepts such as technology or ICT. In short a tool is a technology used in a particular moment of action. This action is mediated by the tool (e.g., Rogoff, 2003; Säljö, 2005; Wertsch, 2007; Vygotsky, 1978). The inseparability of different concepts to moments of action is then emphasised in the use of intersectional concepts such as computer-mediated communication and educational settings. In the papers this is particularly evident in, among others,
the use of ‘dialogical intersection’ in the second paper, ‘genres of communication’ in paper four, and the discussion of the concept ‘learning communities’ in the first and third papers.

Second, the process of addressing the inseparability of observed phenomena was a long and winding road. During this trip a few concepts were deployed that I later found to be unsuitable for a transactional analysis that focuses on moments of action. Whenever writing a thesis takes a long time, changes in the way to discuss conceptualisation of participation in education necessarily occur. In the early stages of my doctoral studies I needed more time to ponder and work on my thinking of education as a transactional activity. Therefore, some corrections in my publications would have been made if these papers were written in a later stage.

In an early effort I wrote about interaction where: "CMC-based collaborative tools for learning can change interaction between learners and teachers as well as support individual" (Jaldemark, 2003, p. 160). The same sense of collaboration is used in the first and third papers. If these papers were rewritten a refinement of the concept interaction would have been attempted. Such revision would exchange it for terms such as communication, discussion, dialogue, or transaction.

Another concept discussed in the commentary text is the concept of activity. In a conference publication empirical material was discussed as recording “one activity in the fulltime five months online course” (Jaldemark, 2005c, p. 1234). In that publication the concept of activity were not clearly specified, a refinement of the concept occurred during the following years. In the commentary text (kappa) of this thesis the concept of activity is used as an overarching concept that generally is related to human action and particularly to education as an activity.

Another shift in use of concepts, from technology to tools, appeared between the conference publication mentioned above and the fourth paper. Even though the papers deployed the same empirical material the conference publication discussed it in terms of “aspects of technology were considered when choosing point of time” (Jaldemark, 2005c, p. 1234). The discussion of the same phenomenon in the fourth paper deploys the concept tools, for example appearing in the quote “the teacher responded by announcing the time and tool for the seminar” (Jaldemark, 2008b, p. 140). These years of conceptualising the activity of education brought along a distinction between technology and tools.

Earlier unclear uses of concepts related to the environment were clarified during the final years of the doctoral project. The third paper uses the concept web-based learning environment. In a later stage of the doctoral project this use would be exchanged for other concepts, such as Learning Management System
or tool. In the second paper, I used terms such as physical environment and home environment. These might better be discussed in terms such as home settings and physical aspects of the environment. Nevertheless, while that paper discussed educational settings, further use of the concept setting may have led to confusion.

The conceptualisation of education has also been modified during the writing, including changing concepts and redefining the relationship between concepts. This process of change and development in a researcher’s thinking is nothing strange. Rather it reflects progress and the researcher’s ambition to reach a better understanding by using more suitable concepts. Sometimes revision in the use of concepts also reflects processes of adaptation to prevailing discourses. However, in this thesis the ambition has been to present a coherent conceptualisation of participation in education. The trip has included unclear thinking that later was expressed in other ways that made the conceptualisation clearer. Nevertheless, in the sense of being developed within a doctoral project this conceptualisation was also a statement from a particular moment of action. Future inquiries will probably further refine such unfinished conceptualisations. In fact that task lies at the heart of academic scholarship.

Another consequence of this transactional approach is that different theoretical perspectives can enrich our understanding of participation in human activities. This approach is adopted in the accompanying papers. Paper one and three focuses on social aspects of participating in the activity of education. While paper one focuses on individual and structural issues the third papers explore different perspectives of participation. Viewed from other angles, papers two and four embrace historical accounts of the studied problem; paper two addresses participation in the Swedish system of higher education; while the fourth paper links participation in online settings of higher education to discourse analysis and ideas about communication genres. Through using historical, comparative, social-constructivist, social-constructionist, and sociocultural perspectives, our understanding of human action is enlarged.

Settings

Until now, the discussion of the general research approach has concerned the relation between man and the surrounding environment. Influenced by Dewey and Bentley’s concept of transaction (1949/1960), a dynamic view of human action has been presented. At the same time, however, all transactions are situated. In other words, there is a need for a further concept or concepts that centre on the “individual’s ongoing transactions with meaningful features of the environment” (Heft, 2001, p. 7). Such conceptualisation should underwrite the idea that “the reciprocity of the environment and the person, is a central feature” (Ibid., p. 7). These concepts should therefore simultaneously link the
agent, the action, and the environment. In this thesis, the idea of a setting meets this need, combining person and environment. In the words of Wertsch (1995, p. 64) tools that shape human “action more generally are inherent aspects of, and hence serves as indexes of, a … setting”.

This chapter examines the concept of setting from two perspectives: ecological and sociocultural. In these perspectives the concept settings have emerged independently. The analysis starts with the ecological view and moves on to the sociocultural perspective. However, since the early 1990s scholars have made efforts to merge these two perspectives (e.g., Altman & Rogoff, 1991; Still & Costall, 1991b). Therefore, this chapter about settings ends with a reconciliation of ecological and sociocultural perspectives.

From Ecology to Setting

In the first half of the twentieth century Koffka (e.g., 1921, 1935) and Lewin (e.g., 1926, 1946/1997), prominent scholars of Gestalt Psychology, shared a worry concerning a dualistic reduction of man’s relation to the surrounding environment. They felt that such reductionism failed to capture “the essential qualities of ‘what it is to be human.’ ” (Heft, 2001, p. 204). These scholars preferred to emphasise the relation between man and the environment, as a contribution to understanding the ecology of settings. Nevertheless, both these scholars divided the environment into different kinds of environment. Koffka (1886-1941) did it in terms of behavioural and geographical environments (e.g., 1935), and Lewin (1890-1947) in terms of psychological and physical environments (e.g., 1946/1997). Therefore, neither solved the dualistic problem.

Barker (1903-1990) and Gibson (1904-1979), two of the founding fathers of ecological social science were influenced by Pragmatist scholars such as James as well as scholars from the Gestalt Psychology community like Koffka and Lewin. Both Barker and Gibson shared the same non-dualistic view of the relation between man and the environment (Heft, 2001). They rejected a separation of mind and world in different kinds of environments. Instead, they emphasised the environment as an ecological concept.

During the 1930s Barker worked as a research fellow alongside Lewin (Barker, 1989). He also broke with the positivist reductionism that dominated US psychology in the late 1940s (Barker & Wright, 1949). That is, he rejected research based on animals, as well as laboratory, experimental and clinical methods (Barker, 1991). He claimed that research on human action needed methods grounded in ecological science (Barker, 1968).

The consequence of Barker’s rejection of reductionism was a 25-year study of the people of Oskaloosa, a small town in Kansas, USA (Barker, 1968). This investigation affirmed the place of the environment in understanding human
action. His main finding was that the patterns associated with the actions of the inhabitants were congruent with a higher order environmental structure, a setting. This structure or setting was not the same as the totality of the environment. Instead, limited parts of the environment were emphasised as belonging to a particular setting. He subsequently suggested that “environment affects the lifespace at the boundary, but also that the distal environment has consequences” (Barker, 1989, p. 19). Both the larger community outside the setting and aspects of the environment within the setting (e.g. other people) transform the action of agents within the particular setting. Settings are analogous to, but they are not, geographical units. Instead, settings have both temporal and spatial dimensions. They exist independently of a particular agent and have a life of their own.

The dynamism of Barker’s theory arises from the existence of different settings and the fact that agents switch between them. For example, an agent is part of one setting when visiting a football game but switches to another setting when at home or in school. Barker’s theory of settings embraces the “collective effects of settings on participants’ actions” (Heft, 2001, p. 262). Heft elaborated on Barkers’ theory:

“settings are best conceptualised as dynamic systems operating as contexts of constraints. They are time-dependent phenomena, with their boundaries established and maintained by the coming together of particular behavior-milieu components, and then subsequently dissolved when those relations no longer obtain” (Heft, 2001, p. 321).

In other words, human action in the environment emerges from multiple influences, and the interplay of the agents and the environment in the setting governs their actions and leads to higher-level outcomes.

At the end of the 1920s Gibson became a colleague with Koffka, and he used Lewin’s field theory in some of his early research (Reed, 1988). Nevertheless, Gibson (e.g., 1971, 1986) elaborated on their findings and claimed that the world is directly perceivable through information stored in a meaningful environment. He argued that “the phenomenal world does not have to be constructed by the mind (or the brain) out of meaningless data” (1971, p. 27). His ecological approach added to a theory of settings, structures of information that are directly perceivable. These structures, called affordances, relate to both agent and the environment and lie between these two elements. Gibson (1986, p. 127) claimed that “affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill … it implies the complementarity of the animal and the environment”. Gibson rejected dualistic explanations and argued that the offer from the environment
is not measureable in quantitative terms. Therefore, a change within the agent does not change the affordance of the object. An agent

“may or may not perceive or attend to the affordance, according to his needs, but the affordance, being invariant, is always there to be perceived. An affordance is not bestowed upon an object by a need of an observer and his act of perceiving it. The object offers what it does because it is what it is” (Gibson, 1986, p. 139).

The affordance and the information that specifies it, point to both the environment and the agent. Nevertheless, this does not embrace a dualism between the agent and the setting. Instead, the affordance is situated and therefore the specifying information of the setting relates to the information that can be accessed by the agent. The affordance is a property “of the environment for a specific agent acting within space-time, not all agents or for all times” (Young, Barab, & Garrett, 2000, p. 152). In other words to perceive the setting “is to coperceive oneself” (Gibson, 1986, p. 141).

Even if Barker and Gibson studied different problems – the former social aspects of human action in settings and the latter agents perceiving and acting in different settings – they both had common theoretical ground. Their views of settings situate human action as an emerging and present process depending on both dimensions of time and the surrounding environment. Both agreed that between the surrounding environment and the agent there is a shared structure. Further, they both agreed that in these structures the agent perceives meaning. Meaning is therefore not a construction in the mind of the agent; rather it is also distributed in the setting and perceivable in the structures. Nevertheless, Barker and Gibson relate to different levels of a setting. While Gibson emphasised the single agent in terms of processes between man and the environment, Barker studied settings from a group level comprising eco-behavioural processes (Heft, 2001). Therefore, these two levels broaden the understanding of human action in a setting.

From Culture to Setting

In the 1920-30s, contemporary with the Gestalt Psychologists and sharing their interest in studying human action as belonging to a whole, Vygotsky and his co-workers Luria (1902-1977) and Leont’ev (1904-1979) worked on solving problems related to human action. The focus of this research was activities and consciousness. Besides building on Marxist materialistic dialectics they were influenced, among others, by the above-mentioned Gestalt Psychologists Koffka and Lewin as well as by Pragmatist scholars such as Dewey and James (e.g., Leont’ev, 1978; Vygotsky, 1926/1994; Vygotsky & Luria, 1930/1994). This troika became the founders of Sociocultural Psychology. In the early years their
work were focused on problems related to human action and different aspects of consciousness or mind, for example in terms of attention, meaning, signs, speech, thinking, and tools (e.g., Leont’ev, 1932/1994; Vygotsky, 1934/1987; Vygotsky & Luria, 1930/1994). This work comprised critique of contemporary views of human action such as “idealistic and mechanistic biologizing concepts appearing in one guise or another” (Leont’ev, 1978, p. 2).

The concept activity emerged in Vygotsky’s (1925/1997) writing in 1925, and, until his death in 1934, was important in his work on how human action relates to different aspects of consciousness or mind. Overall in the work of the troïka, social and meaningful activity is an explanatory principle and a generator of human consciousness. These activities are mediated by signs and tools and are set in a culturally, historically, and socially transformed setting (Vygotsky, 1978). This social view of activity is in opposition to the empiricist and idealist positions discussed earlier in this thesis.

To explain how the development of consciousness relates to activities and settings Vygotsky introduced the concept ‘zone of proximal development’ (the zone). In studies of child development he found that the child together with other human beings could “do more in the intellectual sphere than he is capable of doing independently” (1934/1997, p. 201). The key concepts informing this capability are imitation and collaboration. Imitation, however, is not of a mechanical and thoughtless character. Instead, it is about carrying out intellectual operations. Children perform these operations in collaboration and with the guidance of more capable people, such as other children and grown-ups. Nevertheless, the possible future operations of the child are limited and depend on their actual developmental level. In other words, “the child can imitate only what lies within the zone of his own intellectual potential” (Vygotsky, 1934/1987, p. 209). In short, Vygotsky (1978, p. 86) defined the zone as “the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers”.

Discussed in terms of agents and activities, this means that in the company of other agents more skilled in the actual activity, an agent can perform operations that are above the agent’s actual skill. If the agent develops in the performed activity he/she will, in the future, have the skills to perform the operations independently of these earlier more skilled agents.

In the 1930s, Leont’ev changed his focus from aspects of consciousness and mind and turned to the concept of activity. Scholars (e.g., Kozulin, 1986a; Zinchenko, 1995) have discussed the political and theoretical reasons for this change. Some of the writings of Luria and Vygotsky were banned for being too bourgeois yet both Leont’ev and Luria continued since they “wished to put their own strengths to the test” (Zinchenko, 1995, p. 39). However, while
Leont’ev continued to work on the concept of activity, this doesn’t mean that aspects of consciousness and mind became less importance; rather, they were “preserved in the form of studying the historical and ontogenetic roots of consciousness” (Zinchenko, 1995, p. 44).

To clarify the concept of activity the troika made a distinction between the German words ‘Tätigkeit’ and ‘Aktivität’ (Leont’ev, 1978). ‘Tätigkeit’ has synonyms such as work, job, function, and doing while synonyms of ‘Aktivität’ are effort, engagement, and diligence (Roth & Lee, 2007). According to historical-materialistic dialectics, the former is in line with meaning of the concept of human activity. Therefore, ‘Tätigkeit’ refers to “socially meaningful activity” (Kozulin, 1986b, p. xvii). This “activity is not to be equated with relatively brief events with definite beginnings and end points … but an evolving complex structure of mediated and collective human agency” (Roth & Lee, 2007, p. 198). ‘Tätigkeit’ is also what is meant by activity in this thesis.

Due to ideological conflicts between the communist regimes of Eastern Europe and the capitalist countries of US and Western Europe, theories developed by the troika – Vygotsky, Luria and Leont’ev – were rarely discussed in the US and Western Europe after Vygotsky passed away. In the beginning of the 1960s Vygotsky’s (1934/1962, 1934/1986, 1934/1987) ‘Thought and language’ were published in English for the first time. In the late 1970s and early 1980s influential work from the troika, such as ‘Activity, consciousness, personality’ (Leont’ev, 1978), ‘Mind in society’ (Vygotsky, 1978), and ‘The making of mind’ (Luria, 1979) also appeared. During this period Leont’ev (1978, 1981) elaborated on the link between human activity and individual consciousness, revisiting the concepts developed by the troika in the 1920-30s. Overall, the work of the troika identified activity and consciousness as aspects of a whole. Activity is inseparable both from the action of the agents and the setting in which the activity occurs. Leont’ev (1978, 1981) linked this inseparability to a general structure of the concept of activity that includes a dynamic and dialectical distinction between three levels: activity, action and operations. Different criteria define these three analytical levels.

In Leont’ev’s structure, activities, such as education or financial accounting, can be distinguished from each other by their object. This object gives the activity its determined direction. However, the object of the activity “is its real motive” (Leont’ev, 1981, p. 59). This motive could either be material or only exist in imagination or thought. An educational activity, therefore, could be

---

1 In the 1980s, two new editions of this work were published. The 1986 version of ‘Thought and language’ is an extended version of 1962 edition. However, in 1987, a new translation was published. This time the title was changed to ‘Thinking and speech’. The new title was said to be closer to the meaning of Vygotsky’s use of these concept. Besides, both thinking and speech are more dynamic concepts than thought and language. Accordingly, the edition titled ‘Thinking and speech’ is used in this thesis.
motivated by the wish to acquire a particular degree or gain skills in financial accounting. Further, there is no activity without a motive. Therefore non-motivated activity cannot exist. In any case of an apparently non-motivated activity, the motive is just concealed. Nevertheless, if the activity loses its motive, it converts into an action, the next level in Leont’ev’s hierarchy. Overall, motives relate to particular activities which suggest different goals and they also acquire concrete expression in actions.

Leont’ev links actions to activity by claiming that “human activity does not exist except in the form of action or a chain of actions” (Leont’ev, 1978, p. 64). These actions translate human activities into reality. Nevertheless, these action or chains of action are relatively independent and may relate to different activities. Further, actions may transfer from one activity to another. In other words, one and the same action can contribute to different activities. Subsequently, an action such as counting could be used in several activities, for example in education and finance. However, the difference is that whereas activities are always tied to motives, actions remain tied to conscious goals. An agent’s performance of a particular action in several different activities relates to different goals. Therefore, actions are goal-directed processes “subordinated to the idea of achieving a result” (Leont’ev, 1981, p. 60). Equally, these goal-directed actions are inseparable from the specific situation that is being transformed. The goals define the intentional aspect of actions or, in other words, the goals define what must be done.

With regard to Leont’ev’s conception of operation, the operational aspect of actions are defined “by the objective circumstances under which it is carried out” (Leont’ev, 1981, p. 63). In other words, this operational aspect is about how an action can be accomplished. Therefore, performed actions are adequate to particular tasks and specific conditions. These tasks relates to goals assigned under specific condition. Accordingly, action relates to goals while operations relate to conditions. Nevertheless, even if the conditions change, goals and the action might remain the same. In such cases, only the operational aspects such as the means, methods or tools used to perform the action change. For example, in higher education teaching financial accounting can be performed through an operation comprising online communication between the agents or it could be accomplished through an operation where agents communicate face-to-face with pen and paper. This is an example of variation in operations according to different conditions (Leont’ev, 1978, 1981).

In short, actions originate in activities and operations transform action. Further, activities have the character that they are in constant transformation. This means that “actions involved in an activity in one situation may be considered to be an entire activity in another situation” (Wertsch, 1981, p. 19). For example communication can be discussed as an activity with a motive of its own. Nevertheless, within education communication is also an action involved
in the wider activity of education. Activities can also become actions if they lose their motive and actions can acquire their own motives and become an activity. This happens when we analyse educational communication as being a part of the agent’s activity of communication. The same transformation process can occur between actions and operations, whenever an action becomes the means of attaining a goal.

This last process can be illustrated in the creation of operations required for communication in online course activity. For novices of online communication, operations, such as writing utterances with a computer and submitting them online on the Internet, appear as actions subordinated to the activity of communication. Later, agents’ incorporate these actions into a more complex action, online communication. By this stage, writing utterances and submitting them online become methods for the delivering a goal-driven action: online communication. This means that these actions convert into crucial operations for performing the action online communication. At this point, the performance of writing utterances with a computer and submitting them online is no longer a goal-directed process. In the activity of online courses the agent deemphasises the goals of these subsidiary actions. They became operations in the process of online communication. The online communication then became a goal-directed action for participation in the activity of online courses.

Since early 1990s scholars working in the traditions of the troika have linked the concepts of activity and consciousness to the settings in which human action and activities occur. These scholars use terms such as activity settings and sociocultural settings and sees activities as “an integrated function of thought and setting” (Martin, 1995, p. 153). This link affirms that human thinking has its origin in activities that embrace cultural, historical, and social aspects (e.g., Wertsch, del Rio, & Alvarez, 1995a). In turn, human thinking is transformed by aspects of activities in settings, for example cognitive and motor actions in the surrounding environment. Setting investigated by these recent investigators include health centres (Engeström, 1993); adult education (Bonk & Kim, 1998); museums (Teenenbaum, Callanan, Alba-Speyer, & Sandoval, 2002); and ethnic groups (Gutiérrez & Rogoff, 2003). Rogoff (1995) emphasises that human activities in such settings is evident at societal, interpersonal, and individual levels. These levels are interrelated through human activity and comprise “dynamic contributions from individuals, their social partners, and historical traditions and materials and their transformations” (Rogoff, 1995, p. 140). Therefore, discussing activity in this manner includes the agent’s relation to cultural and social aspects of the environment “in which each is inherently involved in the others’ definition. None exist separately” (Ibid., p. 140).

On a societal level, participating in a setting is, metaphorically, equivalent to serving as an apprentice who acquires activities related to society’s practices and institutions. On an interpersonal level, human action is about guided
participation in processes and systems of social involvement, where guidance is offered by other persons that includes cultural and social values. ‘Participation’, therefore, refers to both hands-on involvement and the observation of an activity. On the individual level, participation refers to how engagement in human activities changes individuals and prepares them, in a later situation, to act in a way predicated upon their participation in an earlier situation. Together, these three levels of human activity in a setting are processes of becoming (Rogoff, 1995).

In summary: The sociocultural perspective on settings emphasises that human action is linked to culturally-, historically-, and socially-influenced activities that are inseparable from the mind or consciousness of agents whose participation in such settings is societal, interpersonal and individual.

**Reconciling Ecological and Sociocultural Perspectives**

The term setting is used by scholars from both the ecological and sociocultural tradition. Common in these traditions is an emphasis on the influence of social and cultural experience in the shaping of thinking and interpretation; that is, on the situatedness of humanity. Farver (1999) argues that this standpoint has roots in both sociocultural theory as well as the ecological theories of Lewin and Barker (e.g., Whiting, 1980). However, ecological perspectives on settings have also met criticism. Lave (1988) criticises Barker’s (1968) ecological conceptualisation of settings, accusing it of giving settings a deterministic environmental view of human action that excludes a relation between actions of the agents and the setting. Heft (2001) met this criticism by arguing for a setting as a phenomenon dependent on both aspects of time and a consensus among the agents. Further, Heft also linked ecological and sociocultural theories.

While the ecological theories of Barker and Gibson focused on behaviour and perceiving, sociocultural scholars emphasise issues related to activities and the development of consciousness. Still and Costall (1991a, p. 230) link these two traditions by emphasising “that human experience is social through and through, and that there is no separate pre-social realm of experience existing alongside the social. Babies live in a world that is social from the beginning”.

This perspective assumes that thought processes arise from participating in activities that emerge in settings. Further, human experience and thought processes embrace representation systems such as language that organise shared human activity. Still and Costall (1991a, p. 235) also claim that, together, ecological and sociocultural views guard each other “against the dualist backslidings of the other”. On one side, ecological view can be supported through the sociocultural emphasis on social issues as being all-pervasive in perception. On the other side, sociocultural views can be supported by radical ecological perceptual theories which assume the inseparability of man and the
surrounding environment. These connections are important for the transactional approach on human action taken as a departure in this thesis.

To sum up the foregoing ecological and sociocultural discussion on settings: a setting is about circumstances, locations, and time in which something occurs or develops. It is understood as something in which a situation exists, including the totality of surrounding conditions. It relates to past, present, and future states of the totality of the surrounding conditions. Moreover, this conceptualisation allows a transactional approach to human action which embraces cultural, ecological, historical, and social transformation of phenomena and which identifies human action as emerging through activities where man is inseparable from the surrounding environment.

Tools
As noted, this thesis takes a transactional approach, where human action, activities and settings are inseparable. However, to understand an agent’s performance in settings, a concept is needed that links the agent to the action. This chapter introduces such a concept that, variously, has been labelled as artifacts (Wartorfsky, 1973/1979), mediational means (Wertsch, 1998) or tools (Säljö, 1999). This thesis prefers the notion of tool as something that emerges or takes shape through activities performed in culturally, ecologically, historically, and socially transformed settings.

Tools have emerged through the history of human action and they “are inherently situated culturally, institutionally and historically” (Wertsch, 1998, p. 24). In this history, agents use and extend on “tools and practices inherited from previous generations. As people develop through their shared use of cultural tools and practices they simultaneously contribute to the transformation of cultural tools, practices, and institutions (Rogoff, 2003, p. 52).

Accordingly, agents and tools embrace an ‘irreducible tension’. However, it might sometimes analytically be productive to reduce action to one or other of these aspects. Neither the tool nor the agent “really exist independently of action” (Wertsch, 1998, p. 25). In other words, a tool is not a tool until it forms part of human action. It is just a culturally-embedded object, thing, or technology, for example computer software, a language, or a knife.

Mediation: Linking tools with other aspects of human action
Wertsch, del Rio, and Alvarez illustrate the inseparability of agents and tools by focusing on how tools “provide the link or bridge between the concrete actions carried out by individuals and groups, on the one hand, and cultural, institutional, and historical settings, on the other” (1995a, p. 21). Tools relate to agents as well as to actions and settings. However, the concept mediation is
the key to explaining this relationship. This concept has its roots in early 20th century thought. Influenced by Gestalt Psychology and Marxism, scholars such as Leont'ev, Luria, and Vygotsky discussed cultural, historical, and social aspects of tools, consciousness, and human development (e.g., Leont'ev, 1978; Vygotsky & Luria, 1930/1994). These phenomena became an essential part of sociocultural theory, as explained earlier. However, the concept of mediation has two consequences. First, it provides a link between individual mental processes and historical and social processes. Mental functioning is socio-historically situated through the internalisation of mediating cultural, historical, and institutional processes. Secondly, mediation associates human consciousness with the use of tools (Wertsch, 2007).

Vygotsky (1978, p. 55) claimed that the function of tools was “to serve as the conductor of human influence on the object of activity”. He discussed this conductor function of tools in terms of being a mediator of human action. In other words, “this involves focusing on agents and their cultural tools – the mediators of action” (Wertsch, 1998, p. 24). Subsequently, mediation allows the creation, drawing out, and shaping of human activity. In other words, “objects themselves can become … tools only in a system of human activity” (Leont’ev, 1978, p. 67).

There are two kinds of mediation, explicit and implicit. Mediation is explicit whenever “an individual, or another person who is directing this individual, overtly and intentionally introduce a ‘stimulus means’ into an ongoing stream of activity” (Wertsch, 2007, p. 180) and where the stimulus means “tends to be obvious and nontransitory” (Wertsch, 2007, p. 180). Nevertheless, to avoid falling in behaviouristic and cognitive reductionism in the understanding of mediation, it is important to go beyond the level of isolated individuals and focus on the role of cultural tools. Hutchins’ (1995) study of the role of sensors (e.g. fathometers, telescopes) used collaboratively by US navy personnel in plotting their ship’s position is an example of such a study.

Mediation is implicit in the sense that agents are unaware of its existence. It “is automatically and in most cases unintentionally built into mental functioning” (Wertsch, 2007, p. 184). As implicit mediation it is integrated into ongoing communicative actions which subsequently become linked to other forms of action – such as dropping a ship’s anchor (Wertsch, 2007).

**Categorisation of tools**

Scholars sometimes discuss tools in terms of various categories. In one of these discussions, Engeström (1999) differentiates between external implements such as signs and internal representations such as mental models. In another discussion Säljö (1999) distinguishes physical (or technical) from psychological (or mental) tools. Where physical tools relates to technical devices such as a computers, paper or pencils, psychological tools are resources used for “thinking
and acting that are stored in language, or, rather, in discourse” (Säljö, 1999, p. 150). Both these scholars, however, discuss the limitations of such category systems. Engeström (1999, p. 381) claims that it is not useful to categorise tools “into external or practical ones, on the one hand, and internal or cognitive ones, on the other hand. These functions and uses are in constant flux and transformation as the activity unfolds”. Their psychological and physical aspects are inseparable. Both these phenomena mutually condition each other and form part of a cultural tool, for example an appropriate use of a computer also needs thinking and composition tools (Säljö, 2005).

**Tool and agent**

Nevertheless, scholars have also discussed how action, agents, and tools interplay in settings (Gibson, 1986; Hutchby, 2001; Hutchins, 1995; Lave & Wenger, 1991; Wertsch, del Rio, & Alvarez, 1995b). As discussed in this thesis tools emerge in culturally, ecologically, historically, and socially transformed settings. Therefore, different tools have emerged in different settings. Tools used at dinner tables, in hunting settings, in a university course or on a Navy ship will differ. As shown by Hutchins (1995) in his analyses of navigation on a Navy Ship, sailors use tools to distribute and coordinate its collective action. Each agent does his/her part simultaneously, with their action linking to the action of the other agents. Nevertheless, not only do tools coordinate aspects of a setting, they also influence awareness of, and access to that particular setting. Access is influenced by the agents’ knowledge of cultural, historical, and social aspects of the actual tool. From this it follows that tools can promote ways of perceiving and manipulating the setting “in ways that can be more or less revealing” (Lave & Wenger, 1991, p. 102). In other words, tools differ in their transparency in the eyes of agents. This transparency relates to differences between agents in understanding the significance and utilisation of tools (Ibid.).

These differences in the use of tools emerge both within and between settings. Some agents might use a knife as a tool only for eating in an everyday setting while others might use it also for wood-carving or as a weapon in a military or hunting setting. In other words, tool-use may be limited for some agents while other agents can identify a wider sphere of deployment. Differences between agents in terms of perception provide an explanation. Gibson (1986) distinguishes qualities of things in terms of what they afford an agent. Things such as a knife or a computer, have different qualities, for example colour, size, shape et cetera.

However, it is what things afford us that “we normally pay attention to” (Gibson, 1986, p. 134). Therefore, if an object, such as a knife, is to serve as a tool, it needs an agent that perceives such an affordance offered by the knife. The purchaser of a chainsaw perceives what it offers for creating firewood; it is less likely that anyone would perceive or purchase a chainsaw for eating.
Influenced by Gibson’s theory of affordances, scholars discuss these differences as, variously, enabling and constraining aspects of human action (e.g., Greeno, 1998; Hutchby, 2001; Wertsch, 1998). In these discussions, a tool is something that constrains the action an agent undertakes. Expressed otherwise, it is within “the power of cultural tools to shape action” (Wertsch, del Rio, & Alvarez, 1995a, p. 23). Further, such affordances and constraints are part of the cultural, historical, and social dynamics that operate between the agent and the tools used in human activities.

Wertsch (1998) discuss pole vaulting as an example of how these affordances and constraints operate. Throughout modern Olympic history, poles have changed. The early poles were heavy and inflexible. Newer materials in lighter, more flexible poles comprised affordances for vaulters who raised the world record to new levels. New poles exposed the constraints of the materials in the earlier poles. As a result, pole-vaulters quickly came to adopt the new poles. Throughout history, affordances therefore have played a part in shaping human action. Nevertheless, the affordances of tools do not automatically impose themselves on human action. Rather affordances set the “limits on what it is possible to do” (Hutchby, 2001, p. 33).

To conclude: tools emerge in culturally, ecologically, historically, and socially transformed settings and activities. In these settings the function of tools is to be a mediator of human actions. In other words, without tools human action, such as communication, is impossible. Therefore, tools link agents to their actions. Without this link a tool is not a tool, it is just a culturally-embedded object, thing, or technology.

Communication

Communication is from the Latin word communicare, which means to share and to participate (Merriam-Webster, 2009). Such sharing and participation embraces not only shared material systems, like urban bus networks, but also systems of shared human action such as speech networks. This thesis discusses human action in terms of acts, spoken and written, of communication. Communication is involved in all human activities, including education; and it also includes agents, tools, and settings of the kind discussed earlier in this thesis.

Communication: Utterances and settings

Since early 20th century scholars have highlighted the importance of communication. Two of these, Bakhtin and Dewey, have offered a transactional account on communication. Bakhtin made a distinction between the concepts language and communication. He referred to a “sentence as a unit of language, as distinct from the utterance as a unit of speech communication” (Bakhtin,
Furthermore, the boundaries of the utterance as a unit of speech communication are “determined by a change of speaking subjects. Such a change, framing the sentence on both sides, transforms the sentence into an entire utterance” (Bakhtin, 1953/1986, p. 73).

This means that while language frames units such as words and sentences, the speaking of agents frames utterances in other ways. In effect, utterances are language in action. This thesis focuses on one form of language in action, a human activity where communication emerges and is performed through computer-based tools in educational settings. As language in action, utterances link communication to the specific educational setting and to the broader human activity that is known as education.

Dewey’s attention to education focused on the relationship between communication and the continuing existence of society. He claimed that the

“society not only continues to exist by transmission, by communication, but it may fairly be said to exist in transmission, in communication … men live in a community in virtue of the things they have in common; and communication is the way in which they come to possess things in common” (Dewey, 1916, p. 5).

Furthermore, he argued that “not only is social life identical with communication, but all communication (and hence all genuine social life) is educative” (Dewey, 1916, p. 6). From this perspective, communication becomes a foundation of social life that unites agents and education as well as enlarging and changing the experiences of individual agents. The exchange of utterances serves to transform the performance of actions and operations by agents in educational settings.

**The constitution and transmission of communication**

Other views have also been influential in the field of communication theory. At the end of 1940s, Shannon (1916-2001) and Weaver (1894-1978) (1949/1998) published ‘The mathematical theory of communication’. Instead of taking a societal perspective, as Dewey did, Shannon started their discussion on communication from an engineering perspective. Nevertheless, both Shannon and Weaver referred to communication as having two different functions, transmission and constitution. However, Shannon and Weaver differed among themselves over the importance of recognising that the transmission of information is not the same as the transmission of meaning. Shannon referred to communication mainly as a technical problem and therefore claimed that utterances “have meaning; that is they refer to or are correlated according to some system with certain physical or conceptual entities. These semantic aspects of communication are irrelevant” (Shannon & Weaver,
On the other hand, the foreword written by Weaver expresses another view closer to the ideas of Dewey, communication is said to “include all of the procedures by which one mind may affect another” (Shannon & Weaver, 1949/1998, p. 3). Weaver elaborated on Shannon’s ideas to include semantics and the effectiveness of communication (e.g. was the transmitter’s meaning recognised by the receiver?). This elaboration highlighted the relevance of meaning to communication – something that was taken up in the social sciences.

Soon after the publication of Shannon and Weaver’s seminal work, scholars began to question the prevailing behaviouristic perspective on human action (e.g., Bakhtin, 1953/1986; Barker & Wright, 1949; Bruner, Goodnow, & Austin, 1956). While Shannon’s view of communication related to a behaviouristic perspective of transmission, Weaver’s emphasis on the relevance of meaning connected with social perspectives on cognition.

The study by Shannon (Shannon & Weaver, 1949/1998) is an example that focuses on technological aspects such as the form and function of channels of communication. He claimed that the “fundamental problem of communication is that of reproducing at one point either exactly or approximately a message selected at another point” (Ibid., p. 31). In other words, communication is about transmission of utterances from a sender to a receiver. Utterances are seen as a fixed element of communication, “bits of information that have any impact on uncertainty or the receiver’s decision-making process” (Krendl, Ware, Reid, & Warren, 1996, p. 96).

A focus, however, on technological aspects of communication relates it merely to the delivery of utterances. Communication is reduced to verbal, written or bodily behaviour that is evoked by a spoken or written utterance. Utterances are reduced to verbal stimuli rather than sources of meaning. The subsequent response from the receiver returns a fresh stimulus to the initiator. In communication, this exchange of stimulus and response form the basis of the behavioural repertoires discussed, for instance, by Skinner (1974) and, before him, Thorndike (1914), and Watson (1925).

Among studies that highlight the psychological or cognitive aspects of communication, Schramm (1954a) provides an early example. He claimed “that each person in the communication process is both an encoder and a decoder. He receives and transmits” (Ibid., p. 7). Instead of seeing the sender and receiver as alternates, Schramm (1907-1987) saw agents in combination – as entire cognitive systems having the capacity to send and receive utterances. The experience of the agent provides a source for the meaning of the dispatched utterance. Therefore, valid communication depends on both the sender and the receiver sharing a similar cultural, social and linguistic repertoire and framework – of being on the same wavelength or reverberating with the same vibrations. Unlike a behaviouristic perspective, a cognitive or psychological perspective
assumes that meaning can be transferred from one mind to another. Scholars have, for example, focused on how agents process and perceive utterances as well as on how agents develop, maintain and change attitudes and cognition (Krendl, Ware, Reid, & Warren, 1996; Schramm, 1954b).

Schramm’s work is an example of an interactional approach to communication. While focusing on psychological aspects rather than cultural, ecological, historical, and social aspects, interactional approaches relate communication to cognition (Dewey & Bentley, 1949/1960; Krendl, Ware, Reid, & Warren, 1996; Schramm, 1954b). Hence, communication is a process where agents actively interplay with other agents while trying to attribute meaning to an external and objective world. Therefore agents use their minds to store their experience of the world as cognitive representations. Subsequently, agents need to use these representations when transferring meaning between each other (e.g., Bransford, 1979; Bruner, Goodnow, & Austin, 1956; Piaget & Inhelder, 1969).

Returning to the ideas of Shannon and Weaver, the constitutive view of communication takes a transactional approach that embraces cultural, ecological, historical, and social phenomena. Communication occurs in a network of interpersonal relationships and is a constitutive process, which produces and reproduces meaning. This view is close to the ideas of Dewey (1916; Dewey & Bentley, 1949/1960) which focus on societal issues and social life.

The work of Bakhtin (1935/1981, 1953/1986) also focused on the constitution of communication. He emphasised the dialogical quality of communication and argued that speakers and listeners are dependent on each other. Successful communication, therefore, must assume that shared meaning is possible. The resultant or developing meanings and utterances are products of social negotiation between the agents. In these negotiations, the meaning of each utterance “comes to fruition only in the response” from the other (Bakhtin, 1935/1981, p. 282). Response and understanding condition each other while they dialectically merge in the process of communication. Furthermore, Bakhtin also claimed that utterances relate to particular genres and in these genres the utterances’ “thematic content, style, and compositional structure – are inseparably linked to the whole of the utterance and are equally determined by the specific nature of the particular sphere of communication” (Bakhtin, 1953/1986, p. 60). Therefore, these genres reflect cultural, ecological, historical, and social aspects of communication and range from the genre of everyday conversation to forms of written and spoken communication found elsewhere – as, for example, in scientific, socio-political, and educational settings.

The distinction between transmission and constitution is important for the field of communication theory. Nevertheless, there are problems with this
distinction. Craig, for instance, has claimed that the definition of communication is “not a binary choice between two competing models, transmission versus constitutive”. Such a distinction, he adds, “is no choice at all” (Craig, 1999, p. 127). In fact, emphasis on either of these two functions of communication mirrors different research communities within the field of communication. Whether their emphasis is on the function of transmission or its constitution, both acknowledge the importance of meaning and utterance. However, research on these functions differs. Studies emphasising the transmissive function builds on linear models of communication that either highlight their technological or psychological aspects, while studies of the constitutive function builds on the interplay of agents engaged in a shared activity. Their resultant participation, therefore, highlights the cultural, ecological, historical, and social aspects of communication (Krendl, Ware, Reid, & Warren, 1996).

Insofar as this thesis emphasises communication as occurring in culturally, ecologically, historically, and socially transformed settings, the constitutive view takes priority. Communication embraces a dialogue between agents that is mediated by tools — a constitutive viewpoint developed further in the following discussion of tool-mediated communication.

Communication and tools

Overall, communication is always mediated. While the transmissive view discusses communication in terms such as channel, decoding, and encoding (e.g., Krendl, Ware, Reid, & Warren, 1996; Schramm, 1954a; Shannon & Weaver, 1949/1998) the constitutive view relates mediated aspects of communication to the social life of humankind (e.g., Bakhtin, 1953/1986; Dewey, 1916). In this social life, agents use tools to mediate communication. As discussed earlier in this thesis, such tools could have physical/technical and/or psychological/mental characters which they relate to the agents through perceivable affordances. These affordances are different for different agents. The perceivable use of tools for communication is therefore different for different agents. Following the transactional argumentation of this thesis, agents’ communication through these tools is also inseparable from the settings in which communication emerges.

One particular case of tool-mediated communication is computer-mediated communication (CMC). This can also be discussed as a transactional concept associated with complex phenomena linked to its status both as a tool and as a setting. Jones (1995, p. 16) discussed it in terms of being more than “a tool; it is at once technology, medium, and engine of social relations. It not only structures social relation, it is the space within which the relations occur and the tool that individuals use to enter that space”.

39
CMC has roots in two inventions, the computer (1940s) and the Internet (1960s). The Internet arose as a result of efforts from different American universities and the American department of Defense to connect computers as a network. This network allowed access to other computers for both research and communication. Originally, this communication included possibilities for e-mail, but soon newsgroup facilities were added. At the end of the 1980s, the World Wide Web were developed and the Internet grew rapidly in the 1990s (Jones, 1998). Since then, CMC has been an expanding communicative phenomenon. Nowadays it includes the possibility of using both older tools such as e-mail or newer conversational instruments which, for instance, combine instant messaging with web cameras. One effect of this diversification is that it is increasingly difficult to discern CMC from other tool-mediated communication. Commonly used tools for communication such as telephones and television also depend on computer technologies. Therefore it seems fair to say that research in the CMC-field is applicable to the constitution of communication. Research from this field also includes discussion on how the conditions for the tool-mediated communication rely on different aspects such as time, relations between agents, and educational content.

Regarding time: research in CMC often classifies communication in terms of being asynchronous or synchronous in its character (e.g., Osman & Herring, 2007; Wu & Hiltz, 2004). Asynchronous and synchronous CMC have a different character and may serve different purposes (Romiszowski & Mason, 2004). The term synchronous is a Greek word and derives from the words syn, meaning with, and chronos, meaning time. Synchronous therefore means with time and an explanation of it is “happening, existing, or arising at precisely the same time” (Merriam-Webster, 2009). This means that synchronous communication is dependant on a real-time exchange of utterances. An everyday conversation between two friends chatting on the phone is a good example of synchronous communication. Synchronous CMC may bring together agents that are geographically dispersed and “in doing so, add immediacy and increase motivation, although it also reduces flexibility” (Romiszowski & Mason, 2004, p. 397).

Asynchronous communication is literally the opposite, ‘not synchronous’. Therefore, asynchronous communication relates to an exchange of utterances that not relate to a specific time. This communication gives the agent more flexibility to communicate wherever it suits them (Haythorntwaite & Kazmer, 2004). In other words, it affords the possibility that agents can initiate communication anytime and anywhere (Andrews & Haythorntwaite, 2007). Further, it also give agents “a lot more time for reflection before responding” (Laurillard, 2008, p. 143). Text-based conversation through either mail or electronic mail is an example of asynchronous communication.
Classification of tool-mediated communication in the two types asynchronous and synchronous is, in general, a useful classification. Nevertheless, it is a rough classification since

"the difference between asynchronous or synchronous communication is often a matter of degree … email is commonly labelled an asynchronous medium even though one user may read and answer e-mails as they arrive, while another user may read and answer e-mails once a week" (Hrastinski, 2007b, p. 34).

Deeper analyses need to go beyond the classification into asynchronous versus synchronous to understand tool-mediated communication. Agents use tools differently and this use is dependent on situational aspects (DeLuca & Valacich, 2008). Agents perceive different affordances in the available tools and they are influenced by conditions in the setting and by the purpose of their activity. Studies show that when communicating through computers agents may also do other things (e.g., Markham, 2004) such as using other computerised communication tools or discussing their work with agents who are also physically present. However, some tools seem better able to support agents’ communicating with each other asynchronously while other seems to be better suited for synchronous communication. Nevertheless, it is the agent who decides whether to use the tool in an asynchronous or a synchronous way (Hrastinski, 2007a). Studies also show that agents use CMC differently depending on who they are communicating with. Agents with a close relationship seem to use a higher amount of tools in their communication than agents who are not so close to each other (Haythornwaite, 2000, 2008).

Harasim (1989) categorised the relation between agents in CMC as either being one-to-one, one-to-many, or many-to-many. One-to-one communication occurs for example in private conversation between two friends or in a discussion between a teacher and a student. Examples of one-to-many communication are teachers lecturing in a classroom or an author who publishes a book about communication. Many-to-many communication occurs for example in a group of people, for example students, sharing and discussing a topic of common interest. The conditions for communication are different in these examples. Exchanging utterances and reaching a joint understanding can be accomplished in different ways. Paulsen (2003) discussed a fourth way of CMC, one-online. He widened Harasim’s model and added a dimension of content. Communication one-online could be interplay with other (non-human) agents which might be an online library of documents, an online database, or a blog to which they have submitted an utterance. Nevertheless, Paulsen’s description of one-online is problematic if we add the dimension of time. From a historical perspective, we could at least argue that there is also a
human agent implicated in any engagement with a document or a database: someone, that is, who previously built the database or authored the document.

Another way of describing one-online participation arises from this hidden participation – where many people access a multi-authored database or document. In such cases, claims about one-to-one or one-to-many communication are vulnerable. Moreover, blogging is another complicated case. Is it one-to-many or one-to-self communication? Nevertheless, from a constitutive and transactional approach this dimension of self-reflection could be said to be an intrinsic feature of human communication. If CMC is discussed as being performed through an online or virtual community, one-online can be described and analysed in terms of agents trying to understand their participation in that community.

Other models of tool-mediated communication comprise agents as well as content (e.g., Anderson & Garrison, 1998; Laurillard, 2002; Moore & Kearsley, 2005). Moore discusses how to facilitate interplay in tool-mediated communication. For instance, he identified three different relations between students, teachers, and content: the interplay between students and teachers, students and content, and within group of students (Moore, 1989; Moore & Kearsley, 2005). Anderson and Garrison (1998) widened Moore’s model and added three more relationships, the interplay within a group of teachers, within content and between teachers and content. However, communication and mediation in educational settings is not easily described as a series of linear relationships. For example, these models fail to include the reflexive interplay between agents and themselves (cf. self-instruction). Moreover, content is also a fluid phenomenon and inseparable from the communication of agents and the activities and settings where it emerges. Accordingly, a full understanding of CMC might need a broader approach than the model originally offered by Anderson and Garrison.

During the 1990s, research into CMC frequently overcame this analytic problem by linking content to the term community, a development that can be related to an account of an online community called the Well (Rheingold, 1993), as well as to various theories about practice (Brown & Campione, 1990; Lave & Wenger, 1991; Wenger, 1998). This research accepted the idea that CMC has a transactional character and is related to the cultural, ecological, historical and social transformation of pre-existing human activities, communities, and content.

To summarise: while communication in some sense is always mediated, findings from CMC-research have assisted the understanding of the constitution of communication. Therefore, this thesis emphasises that communication is constituted through tools; a constitution that embraces aspects of time and location. This process relate to the agents, their activities, and the particular setting in which the tool-mediated communication occurs.
Educational settings

To sum up the discussion so far: this thesis examines how participation in the activity of education relates to communication and tools. However, to understand this we first need a clear conceptualisation of participation in education. We turned our attention to the idea of learning environment. Nevertheless, this idea was identified as problematic by earlier social scientists. Therefore, the relation between man and the environment has been subjected to continuing scrutiny. This has led to a foundational theory of human action comprising a dynamical non-dualistic point of view. This theory builds on transactional thinking and embraces the concepts action, activity, communication, settings, and tools. The preceding chapters include links between these concepts and discussions on how they relate to each other through cultural, ecological, historical, and social transformation of these phenomena. In short, these concepts are seen as inseparable and as different aspects of a whole. This discussion embraces the conceptualisation of participation in education used in this thesis. This conceptualisation embraces the environment as important but prefers the notion of the educational setting – the circumstances, locations, and time in which education as an activity occurs or develops.

An educational setting is understood as something in which education exists and refers to the totality of surrounding conditions. It embraces cultural, ecological, historical, and social aspects and therefore relates to past, present, and future states of these conditions. Aspects of other settings, such as the home settings of students in online education, might intersect with the educational setting (see Paper II). Further, the conceptualisation of participation used in this thesis embraces education as an activity relating to actions, agents, settings, and tools. Like all activities, education has a motive that here is defined as agents participating in teaching and learning about specific aspects of reality. This performance of teaching and learning embraces the communication of human experience. From this motive it follows that communication is an ever-present aspect of this particular activity.

Education as an activity operates through educational settings. In these settings, agents such as students and teachers perform different goal-directed actions, for example assessment, lecturing, planning and conducting of tasks and so on. In order to accomplish such actions, students and teachers perform operations that relate to particular educational conditions, for example group-discussions over particular issues, submitting an utterance to a blog as part of a task, or taking notes from a book. However, agents perform these actions in company with other agents. This collaborative feature of educational settings allows the possibility of agents performing operations that are above the actual level (or zone) of a solo agent. If the agent develops the particular action, he/she
will have the skill to perform the operation independently of their more skilled agents or mentors.

In the performance of different actions, agents use tools. These tools become the mediators of action. Nevertheless, agents use tools differently. Further, they also perceive things, objects, languages, or features of a tool in different ways. These differences relate to differences between agents’ perceptions of the affordances which they utilise.

Until now, the discussion of this thesis has concerned general questions. Such a discussion is important as a theoretical foundation for the remaining chapters of the thesis. We will now advance the discussion to consider the concept of educational settings within Swedish higher education where communication between the agents is supposed, or assumed, to be mediated by computers (CMC).
Overall, this thesis discusses how communication and tools are linked to participation in the activity of education. This chapter narrows the discussion to higher education, particular educational settings that embrace physically-separated agents using computer-mediated communication (CMC). Over time, however, these settings have been discussed in different ways. Until the mid-1990s, participation in these settings was usually discussed in terms of distance. More recently, the idea of participating through online settings has become dominant. Nevertheless, the difference between distance, face-to-face, and online settings may be hard to discern. Therefore, the discussion here links educational settings to all three terms. Overall, these three settings might be different aspect of an educational setting. This chapter starts with a brief historical overview of how higher education went online. It is followed by a political analysis of how successive initiatives have shaped educational settings in Swedish higher education. And, finally, this chapter deals with how research in Swedish higher education has gone from discussing distance to preferring emphasis on the online features of higher education.

Higher education goes online: From correspondence teaching to online settings

The phenomenon of online settings in the practice of higher education intertwines with the emergence of computer-mediated communication. However, before reaching that nexus we will start this discussion with a historical overview. This overview starts with tools for communication that pre-date computer-based tools.

Inventions such as the medieval scriptorium, Gutenberg’s moving-type printing press and the public postal service system challenged oral or dialogic practice in higher education. Gutenberg’s ideas, for instance, made it possible for duplicate and authentic copies of literature to be circulated to a wide audience. The emergence of a public postal service system fostered communication over global distances. These two inventions are examples of the impact such tools have had on both possibilities for communication and the resultant reorganisation of educational settings. In higher education, these inventions laid the foundation for distancing students from teachers. Through these innovations, educational settings comprising the physical separation of
students and teachers became a feature of higher education after the first half of the 19th century. Furthermore, this process has involved the use of tools for the distribution of higher education texts and for supporting communication between students and teachers. Letter-based communication, associated with correspondence teaching, has been extended to include complex settings that embrace the use of several tools in the communication-process (e.g. radio and television). During this period – most of the 1900s, nearly every tool for communication has supported participation in distance-based educational settings (Anderson & Garrison, 1998). Further, these tools enhanced communication in different ways (Anderson & Garrison, 1998; Hutchby, 2001).

In 1836, London University developed an external system for assessment (Daniels, 1999). In the following decades, correspondence teaching, a systematic use of letters as a tool for distributing education, developed. In the second half of the 19th century, this made it possible for students to take their examinations through correspondence (Holmberg, 1960; Moore & Kearsley, 1996).

However, participation in correspondence education comprised asynchronous communication between a single student and a teacher – one-to-one communication. In the beginning of the 20th century, this constraint was challenged by tools which could support other forms of communication. Between the two world wars higher education implemented the use of tools such as radio (Maskow, 2000) and television (Pittman, 2003). These created broadcast educational settings where many students could encounter the same teacher. However, except in the use of two-way radio and phone-in programmes, this communication was constrained by a one-way flow of information, from the teacher to the students (Bates, 2005). Despite this difficulty, universities have continued to use television in their distance education, for example in China (Daniels, 1999).

More recently, tools that allow both asynchronous and synchronous communication have underpinned the reorganisation of educational settings in higher education. The use of these tools has enhanced the possibility of communication and interplay between students and teachers. Chat, instant messaging, telephone- and videoconferences are examples of such synchronous tools. Blogs, computer-conferences, e-mail, streaming video and wikis are examples of tools that can enhance asynchronous communication (e.g., Bassili & Joordens, 2008; Bates, 2005; Cole, 2009; Hatzipanagos & Warburton, 2009; Hrastinski, 2006; Kim, 2008). Together the use of these tools has the potential to enhance multi-modal communication between students and teachers. Besides one-to-one communication in correspondence settings and one-to-many communication in TV and radio settings, these tools have also enhanced many-to-many communication (Harasim, 1989).
Harasim (1989) argued that the emergence of a many-to-many channel has been sufficiently unusual to allow the claim that communication in online settings are not the same as in face-to-face or distance settings. Nowadays the difference between distance, face-to-face and online settings remains cloudy (for an analysis see Paper II). Alternative labels, sometimes used, are ‘blended learning’ (e.g., Percival & Muirhead, 2009; So & Brush, 2008) or ‘flexible learning’ (e.g., Collis & Margaryan, 2007; Rennie & Mason, 2007).

Since mid-1990s two theoretical accounts of online participation in educational settings have emerged; one highlights computer-supported collaborative learning (CSCL) (e.g., De Smet, Van Keer, & Valcke, 2009; Leijen, Lam, Wildschut, Simons, & Admiraal, 2009); while the other highlights the role of communities. In both these approaches CMC relates to the social life of education, studied in educational settings such as higher education.

CSCL studies, however, emphasise collaboration and the role of computerised tools in educational settings (Koschmann, 1996; Koschmann, Hall, & Miyake, 2002), while studies from a community perspective emphasise the social-psychological relations between agents in different settings. Within the latter approach, communities are described, variously, as online learning communities (Carlén & Jobring, 2005; Seufert, Lechner, & Stanojevska, 2002), virtual communities (Renninger & Shumar, 2002), virtual communities in the service of learning (Barab, Kling, & Gray, 2004), virtual learning communities (Daniel, Schwier, & McCalla, 2003), and web-based communities (Haythorntwaite, 2008).

Nevertheless, these two approaches are not completely isolated from each other (de Laat, Lally, Simons, & Wenger, 2006). Some studies, that is, draw upon ideas from both CSCL and Community-based approaches (e.g., Amhag & Jakobsson, 2009; de Laat, Lally, Lipponen, & Simons, 2007; Pöysä & Lowyck, 2009).

**Swedish higher education goes online**

**The political trajectory**

Distance-based participation in educational settings of Swedish higher education emerged in the 1950s (SOU1975:72). During the two decades that followed, participation through these settings was not part of national higher education policy. Nevertheless, a few initiatives seem to have been important. Collaboration between non-academic institutions and a single university began in 1953 when Hermods, once claimed as the largest correspondence school in the World, combined with Lund University to produce joint courses. These comprised correspondence, contact and summer courses on campus. Approximately 4 000 of the 16 000 enrolled students completed the courses.
and passed the exam (Gaddén, 1973). In 1965, the Swedish Broadcasting Company (SR) and Stockholm University ran a course in political science, using radio broadcasts that not only covered the lectures but also answered questions submitted by students. This course used the same literature and seminars as in the campus-based versions of the course. Eighteen percent of the enrolment, approximately 1 260 students, met the course requirements and completed the course.

At the end of the 1960s and the beginning of the 1970s Hermods together with Swedish Radio and the Swedish National Board of Education (Skolöverstyrelsen) organised in-service training for teachers in English and Mathematics. These courses reached 60 000 teachers and comprised radio and television broadcasts, printed material, evening meetings and additional meetings in the summer months (SOU1975:72).

Around the same time, the Swedish government embarked on a major reform of higher education. This reform, led by the University Planning Committee, became known as U68 (SOU1973:2). Of specific relevance to this thesis, was a change in national policy on distance-based education in higher education. In 1970, U68 initiated experiments that embraced the provision of higher education through distance settings (Prop. 1975:9). This initiative was intended to relieve pressure on the older universities and, at the same time, to widen participation in higher education (Willén, 1978). Simultaneously, a Committee for Radio and Television in Education (TRU) experimented with radio and TV in educational settings. Later, the government extended the remit of this committee: TRU was also to inquire into the future organisation of distance settings in higher education. Its final report suggested two organisational models. Distance settings in higher education could either choose a single organisation, like the set-up of the British Open University. Or it could operate with a decentralised organisation and responsibility spread among the existing Swedish universities (SOU1975:72).

Sweden chose the latter small-scale model, offering universities the autonomy to conduct higher education through distance settings. However, after twenty years the expectations on this organisation were not fulfilled (SOU1998:83). Between the academic years 1973/74 and 1976/77 extensive experiments were set up within the Swedish system of higher education, such that distance education enrolments in the academic year 1974/75 amounted to approximately 1 500 students (Willén, 1981). Since the academic year of 1977/78 distance settings have been an enduring part of the system (Prop. 1975/76:110). The reformation of higher education initiated by U68 was thus finally implemented in 1977; almost ten years after they had been first discussed (Prop. 1976/77:59).

After these reforms, the Government did not initiate any changes in the national policy on distance-based participation in educational settings until the
beginning of the 1990s. In 1992, the Ministry of Education (Prop. 1976/77:59) suggested that responsibility for initiatives should remain within the local universities, but that the system would be more effective if such responsibility was coordinated and distributed in a different way. Moreover, the Ministry emphasised the importance of collaboration and the distribution of knowledge between universities (Utbildningsdepartementet, 1992).

In 1993, the first of three Swedish university consortia was created (SOU1998:84). These three consortia, ‘Konsortiet för nationell distansutbildning’, ‘Svenska Distanshögskolan’, and ‘Västsvenska Distanskonsortiet’ acted as forerunners to the Swedish Net University, a national initiative of the early 2000s.

In 1995, the Minister of Education and Science appointed the Commission on Distance Methods within Education (DUKOM). The task of this commission was to outline policy strategies for creating distance settings in the educational system. In a final report it emphasised that higher education should continue to work in a dual-mode system. Both distance and face-to-face settings were to be part of flexible higher education that embraced local study-centres and computers. DUKOM also emphasised that local universities and organisations on the national level (e.g. university consortia) should share responsibility for developing distance settings and associated teaching materials and competencies. Finally this report suggested that a national website should be developed which, among other things, should include a catalogue of courses based on distance settings (SOU1998:84).

In 1999 a new agency, the Swedish Agency for Distance Education (Distum) was born (Prop. 1997/98:62). This agency embraced some of DUKOMs suggestions However, Distum’s main task was to develop methods for distance settings in adult education based on the use of computers in distance settings. This emphasis indicates a shift from distance to online settings in the Swedish system of higher education. Nevertheless, the Ministry closed the Agency in 2002. Among the reasons given for the closure was the reluctance of the universities to accept Distum’s role as a change agent (Holmberg, 2003). Therefore, the government replaced Distum with a new agency, the Swedish Net University Agency (Prop. 2001/02:15). This agency, however, has retained the responsibility of providing a national course catalogue which, in its turn, exists as the Swedish Net University (2007).

In 2006, the Government carried out further reorganisation of higher education, fusing the work of the Swedish Net University Agency and the Council for the Renewal of Higher Education into the Swedish Agency for Networks and Cooperation in Higher Education (Prop. 2004/05:162). The main task of this fused agency was to promote and support the development of higher education in general. In fulfilment of this task, the agency emphasised educational development, online settings and widened participation.
The Government subsequently undertook a new reorganisation of higher education, with the aim of reducing the number of national agencies. As a result, the Swedish Agency for Networks and Cooperation in Higher Education closed on the 1st of January 2009 (Prop. 2007/08:01). The tasks of development and support of higher education were decentralised. Issues related to online participation in educational settings would either be internal to local universities or the subject of collaboration between different universities.

At the time of writing (2009), the Swedish system of higher education is relatively decentralised. Each university is responsible for carrying out higher education, including the use of online settings. This decentralised structure has led to practices based on small-scale thinking where each university department organises its own version of higher education in face-to-face as well as online settings (Holmberg, 2003).

Although, as noted, distance and online settings have been a part of the rhetoric of Swedish practice since the end of the 1960s (Willén, 1981), they did not gain immediate material support. A comparison of the enrolments of students between distance/online and face-to-face settings reveals that courses and programmes offered through distance/online settings had reached a trough during the 1980s. Nevertheless, during the 1990s, attention to expansion of these settings intensified. In the academic year 1991/92, 15,000 (6.7%) students studied in distance settings (Utbildningsdepartementet, 1992) while in 2006/07 online settings enrolled 89,000 students, 23.4% of the university population (Swedish National Agency for Higher Education & Statistics Sweden, 2008).

In other words, since the 1950s Swedish higher education has undergone a transformation. Originally dependent on a campus-based mode of organisation it has moved to using computerised tools in both face-to-face and distance/online settings. Simultaneously, enrolment in higher education based on distance/online settings, have gradually increased from 1,500 students in the academic year of 1974/75 to more than 89,000 students in 2006/07. If we include campus-based students who also chose to take online courses, the impact of online settings is even more significant.

The research trajectory I: from distance …

Although Swedish researchers have studied distance-based participation in educational settings at least since the early 1960s, educational settings embracing CMC in Swedish higher education are a recent phenomenon. Before the 1980s, for instance, Holmberg (1960) wrote about methods of teaching by correspondence. In the 1970s, three doctoral theses embracing issues of distance-based education were written. Two researchers from Lund University studied correspondence teaching in adult education, with Flinck (1978) studying issues of telephone tutoring and Bååth (1980) focusing on postal two-
way communication in correspondence teaching. The last study included the first examination of computer-assisted tutoring, even if the computers were used offline as a source of pre-programmed comments on multiple-choice questions given to students. The teacher scanned students’ answers with an optic reader, printed out the subsequent pre-programmed comments, and mailed them to the student. These two early projects, however, did not embrace higher education.

Research on higher education entered the stage in a study by Willén (1981) from Uppsala University. She studied the introduction of distance-based settings into the Swedish system of higher education. She described and evaluated early experimental programmes and made a follow up-study of these experiments. After this publication, Swedish research on distance-based participation in educational settings of higher education went into decline for nearly 20 years, until Johansson (1999) published a second Swedish thesis on distance in higher education. He studied students’ educational communication through interactive video and focused on the implementation of constructivist approaches to learning in distance-based educational settings. His study revealed that this approach was valued by the students as raising the quality of their educational programme.

The research trajectory II: … to online

Since the study of Johansson (1999), research on participation in distance education in Swedish higher education has increasingly addressed online settings. Published theses have focused on participation through computer-mediated communication in educational settings in various courses and programs in, variously, Business Administration (Hrastinski, 2007b; Nuldén, 1999; Olsson, 2007), Dental Science (Mattheos, 2004; Schittek Janda, 2005), Education (Johansson, 2009; Lindberg & Olofsson, 2005; Malmberg, 2006; Mattsson, 2009; Reneland-Forsman, 2009; Roos, 2005; Wännman Toresson, 2002; Östlund, 2008), Engineering (Jonsson, 2004; Keller, 2007), Health Science (Keller, 2007), Informatics (Berglund, 2005; Nuldén, 1999; Rydberg Fähræus, 2003; Svensson, 2002), Library and Information Science (Thórsteinsdóttir, 2005), Second Language (Karlström, 2009), and Social Work (Björck, 2004). Overall, these studies have reflected a diversity of scientific approaches, from action research, discourse analysis, ethnography, experimentation, feminism, hermeneutics, sociocultural approaches, and survey analysis. Methods and techniques applied in these studies have included case studies, conversation analysis, document analysis, experimentation, factor analysis, interviews, multiple regression analysis, observation, and questionnaires. Their findings are relevant to this thesis.

Swedish studies of CMC and participation in educational settings have pointed to significant features of agents’ use of computer-based tools (Jonsson,
Jonsson (2004) examined the circumstances of technology appropriation by focusing on groups’ and individuals’ use of cognitive and physical resources in their daily practice. He suggested that the availability or lack of tools is not the problem. Further, he emphasised that well-planned courses and impressive technological setups are not enough. More important is how tools relate to the requirement of content and to the characteristics of the agents. Keller (2007) studied one of these characteristics of the agents, the acceptance of CMC by academic staff and students. Her study identified that acceptance of CMC was related to performance expectancy, results demonstrability, and shared values about good learning and teaching. Östlund (2008) focused on how such aspects influences students learning in CMC-supported educational settings. She found that off-campus students experienced obstacles when combining studies in higher education with their commitments in everyday life, such as family and work (see also Wännman Toresson, 2002). They were also impeded by their novice status in higher education; and their lack of familiarity with tools for CMC. On the other hand, students valued the possibility of using CMC for keeping in touch with their peers. In a similar setup, Olsson (2007) studied Business Administration students performing communication face-to-face as well as online. In a mix of different settings he found no correlation between aspects of students’ use of CMC, such as access to and skills, and subsequent success in their studies. Instead their success could be predicted on the basis of their adoption of an achievement-oriented approach to learning and on their assumption that learning is an individual process (see also Lindberg & Olofsson, 2005). These studies of features of agents’ use of CMC points to the importance of understanding how participation in CMC relates to the conditions of the individual, a discussion that is extended in the first, second, and fourth paper of this thesis.

Issues related to collaborative aspects of participation through CMC in educational settings, for example within the student-group or between students and teachers, have also been highlighted in Swedish research of higher education (e.g., Björck, 2004; Hrastinski, 2007b; Johnsson, 2009; Lindberg & Olofsson, 2005; Malmberg, 2006; Mattsson, 2009; Reneland-Forsman, 2009; Svensson, 2002; Wännman Toresson, 2002; Östlund, 2008). For instance, Lindberg and Olofsson (2005) found that students seem to value their independence from their co-students and teachers. In online settings this was linked to feelings of being mutually at ease. Other collective aspects of group learning, such as responsibility for each other’s learning was found to be problematic since it might challenge the unity and harmony of the group and the sustaining of a safe working atmosphere. Instead of laying out conflicting views and contrasting standpoints, the group collectively operated inclusively, leaving the learning of each student to became an individual endeavour.
Lindberg and Olofsson (2005) emphasised that the sense of belonging to a learning community in the setting seemed to be more important than other collective aspects of group learning. One of the phenomena that supported this kind of individual participation in the online setting was the emphasis placed on assessing students individually.

Östlund (2008) has suggested that this attention to individual participation arose from a gap between the teachers’ ambition to use the online setting for collaborative purposes, and the students’ belief that such collaboration was unnecessary for successful participation in the courses. The teachers’ ambition was also circumscribed by their own limited skills and the limited time frames they had for designing such educational settings. However, some Swedish studies have consciously focused on student collaboration. Svensson’s thesis (2002) extended across several studies of how students at learning centres communicated through different tools. His purpose was to understand how participation in this tool-mediated communication could support the emergence and shaping of learning communities. He found that the formation of these learning communities could be understood in terms of a desired gathering of social acquaintances. Subsequent change within these communities related to agents’ negotiations. Such educational negotiations have been studied by other scholars (e.g., Björck, 2004; Hrastinski, 2007b; Johnsson, 2009; Malmberg, 2006; Mattsson, 2009; Reneland-Forsman, 2009; Wännman Toresson, 2002). Mattson’s (2009) study of division of labour in study-groups revealed three different strategies among the students: cooperative, collaborative, and hybrid models of participation. These models were a critical feature in the steering of their work. While the cooperative model emphasised individual work and minimal communication between students, the other two models highlighted group-work and participation in extensive communication. Malmberg’s (2006) study investigated collaboration between teacher training students. In his study students worked in small groups with a problem-oriented task. The investigation showed differences between students’ asynchronous and synchronous communication. Asynchronous CMC focused on course tasks while synchronous CMC embraced private and social conversation (i.e. chat). In Hrastinski’s (2007b) study such synchronous CMC supported personal and cognitive dimensions of communication and learning. Therefore, he suggested that synchronous CMC is appropriate where utterances are dominated by questions at a low complexity, typically concerning task issues and social support. While Malmberg (2006) claimed that an intensive use of synchronous CMC had a positive feed-forward effect on asynchronous CMC, Hrastinski’s results also suggest that social conversation is important in constructive online collaboration. Björck (2004) described this as small-talk. He claimed that social conversations performed in face-to-face settings become an integral part of participating in education through CMC. This small-talk was accessible to all
participants, co-students as well as tutors. Nevertheless, it is sometime difficult, in Björck’s study, to discern the distinction between curricula-related talk and small talk, a topic also discussed by Wännman Toresson (2002). She claimed that the educational value of processing content through CMC can be questioned. Her study of women’s making of knowledge in online settings found that the students were satisfied with the computer conference tool. Yet associated communication difficulties meant that the students’ utterances were predominantly univocal without showing any signs that the students developed new perspectives on content. Reneland-Forsman’s (2009) study of teacher training students tells an alternative story of content-processing through CMC. Her study emphasised that distance, numbers, and time are aspects that offers strengths for knowledge-building and meaning-making. The distance of asynchronous communication forced participants to express their thoughts into written language. This process afforded criticism and reflection. Number of voices afforded impact from other’s experiences. The aspect of time afforded opportunities for students to develop new perspectives since they encountered concepts again and again. The study by Johnsson (2009) also included teacher training students performing asynchronous CMC. She focused on issues of power in study-groups. Her study emphasised that CMC are influenced by various aspects of group composition. Of these aspects, being a native Swede, having a high socio-economical background, and being an older student, correlated with a high degree of participation in the online settings. Furthermore, agreement within the groups was correlated to both higher shares of males and speaking Swedish at home. Fewer utterances were posted in groups with a high share of males.

The above discussed theses show that collaboration has been an important theme in research of Swedish higher education. These studies have highlighted the complexity of collaboration through CMC in educational settings. This complexity is further studied in the papers of this thesis, particularly in the first, third, and fourth paper.

Swedish educational researchers have studied aspects of how to design participation through CMC in educational settings (e.g., Berglund, 2005; Karlström, 2009; Mattheos, 2004; Nuldén, 1999; Roos, 2005; Rydberg Fähræus, 2003; Schittek Janda, 2005; Thórsteinsdóttir, 2005). One aspect of design is the attention given to feedback and formative assessment. Nuldén (1999) studied improvement of educational practice in online settings. He identified mandated participation in educational communication (e.g. peer review among participants) as worthy of investigation. Further, he emphasised communication between students and teachers as important for formative assessment. Roos (2005) also studied formative assessment in online courses. He discussed how assessment communication in these courses can be an ‘add-on’ or an ‘add-in’ to higher education. He focused, for instance, on add-in
issues such as the narrow role of teachers’ online feedback compared with the wider role that such formative assessment could have in fostering a learning society.

The problems of formative assessment identified by Nuldén and Roos merge in aspects of delayed feedback, something identified by Rydberg Fähræus (2003) as a recurrent problem associated with CMC in educational settings. She also highlighted problems associated with the incorporation of low-engaged participants and the difficulties of reaching agreement in these online settings. Nevertheless, she suggested that delay fostered reflective thinking and that it eased the many-to-many distribution of information and resources. Overall, she felt that the problems and opportunities of educational communication were contingent upon a range of factors: the suspension of time and locations, the text-based mode of online utterances, their dependence on online tools, and the design of appropriate tasks. Mattheos’ (2004) study of the interplay between dental students and their surrounding environment also emphasised the importance of feedback and task design. It examined both face-to-face and online settings, and focused on these settings’ roles as mediators of communication. He concluded that the use of CMC should incorporate personal feedback and contact with teachers. He emphasised that online settings are better suited to tasks such as commenting upon texts while face-to-face settings might be better suited to brainstorming tasks. In another study of dental students, Schitteck Janda (2005) focused on textual aspects of CMC. He felt that students using free text communication in their training would be better prepared to meet their patients. Therefore, he emphasised that such a tool could play a significant role in educational settings. Nevertheless, he also claimed that computer-assisted learning should only be used as a supplement to traditional methods. Also Karlström (2009) addressed the problem of tools for computer-assisted learning. In his study of second language students he discussed how the design of these tools afforded particular views of participating in the activity of education, particularly on how students should use language. Therefore, the task of the educational organiser is wider than just providing the students with a tool. As important to managers and designers is awareness of how the choice of tools affords and constrains the participation of the users.

These diverse studies reveal educational problems related to geographical aspects of communication and tools, an issue further developed in Swedish research of participation in educational settings (e.g., Berglund, 2005; Thórsteinsdóttir, 2005). Berglund (2005) for instance discussed geographically distributed aspects of CMC in educational settings. In his study, information technology students from both Sweden and the US formed teams that had the task of developing a software system. The study included a model for understanding as well as developing this geographical distribution. It embraced aspects of content, how students learn, their motives for learning, and how they
experience their educational setting. These aspects must, according to Berglund, be discussed as belonging to a whole. Thorsteinsdóttir (2005) studied the information-seeking behaviour of library and information science students. She found that geographical distance influenced distance students information seeking. Access to information locally was important for these students. This geographical effect could be eliminated by a more varied library and technical support. Therefore she concludes that new tools both solve and create new educational problems, a conclusion that could be drawn from other studies (e.g., Rydberg Fähræus, 2003). As these Swedish theses show, design of education is a recurrent theme in Swedish research of higher education. Nevertheless, the focus in this thesis is to discuss conceptualisation of participation in the activity of education. This thesis is an extension of these earlier Swedish studies of educational design. The included four papers highlight this discussion.

**Communication, participation, and tools in Swedish educational settings**

This chapter on educational settings in higher education deals with the history of how higher education went online. This story starts with how online settings emerged from the use of tools for mediating communication in various educational settings. These tools have developed from letter-based correspondence teaching to settings that include the use of computer-mediated communication. In the case of Swedish higher education this development started in the 1950-60s with a few experiments conducted at local universities without any interference from the national policy level. In the 1970s national experiments were supported. Since then, Swedish national policy has comprised a decentralised dual-mode system where local universities are responsible for both face-to-face education on campus as well as distance or online tuition. In 2009 the latter settings include nearly 25 percent of the student cohort.

The analysis of Swedish research on participation in online settings of higher education needs to be discussed as a whole, including aspects of agents, communication, and tools. Further, the educational value of online processing of content is not yet clear. Indications of how students develop new perspectives on content need more attention. However, the analysis shows that participating in CMC in Swedish higher education is complex, embracing agents, content, feedback, locations, and time. At the heart of this complexity is the appropriate design of educational settings. This design embraces a complex relationship between agents’ use of different tools and their collaboration.

Therefore, both synchronous and asynchronous tools are important for participation in educational communication, though they facilitate social and psychological issues as well as supporting constructive academic collaboration.
However, teachers’ ambitions on using CMC for collaborative purposes are constrained by limitations in their skills and time frames. Further, these limited collaborative ambitions are in tension with any parallel emphasis on individual assessment. The teachers’ ambitions also include responding to the characteristics of students, such as commitments in their everyday life, approaches to learning, their previous experience of academic studies and their familiarity with CMC. Further, design of CMC in educational settings is facilitated by students’ using it for collective negotiation of content and for the solidarity that arises from membership of a learning community. Nevertheless, using CMC for collaborative purposes may run against the wishes of any student who prefers or desires individual participation.

Ideas of how to conceptualise participation in education in terms of educational settings is discussed in the second chapter of this thesis. Nevertheless, as shown in the review of Swedish research of participation in online settings of higher education such discussion is de-emphasised. However, the analysis of participation and CMC in Swedish higher education reveals a tension between individual and collaborative aspects. In the earlier studies this tension embraces ideas of communication, participation, and tools. The review suggests that these ideas and the tension between individual and collaborative aspects must be discussed in terms of a dynamic whole. This discussion of a dynamic whole needs to include both educational design as well as research of educational phenomena. Overall, this thesis extends these earlier research results, by emphasising how participation through CMC in the activity of education could be conceptualised. The next chapter is both a summarised illustration of this conceptualisation of participation in education as well as an extension of earlier Swedish studies of participation, CMC, and educational settings.
IV. SUMMARIES OF PAPERS

Introductory reading to the papers

This chapter gives a summarised introduction to the four published papers. In short, the first paper is posed as a question: in English titled as ‘Participation for everyone? A critical discussion’. This paper open up the field of participation in the activity of education by focusing on conditions for participating through computer-mediated communication (CMC) in educational settings. The second paper takes a historical perspective by highlighting how changed conditions for participation in higher education relate to CMC. The third paper continues by emphasising the tension between individual and social aspects of participation in computer-based educational settings. The final paper focuses on the relation between participation and the constitution of communication. Overall, the papers and this commentary illustrate this thesis’ conceptualisation of participating in the activity of education.

Before providing summaries of the four papers I will give a few conceptually notes on the papers. These notes might clarify the reading of the papers. Distance settings are used as a concept in the second paper. The reason for using ‘distance’ in the title of the paper relate to the historical discourse. In 1990 it was the primary concept while ‘online’ was an emerging concept but still in the cradle of the discourse. Nowadays both these concepts are used. Nevertheless, sometimes it is hard to tell the difference between them in the Swedish practice of higher education. However, in this thesis the term online setting is preferred.

Discourse is a concept embracing many different meanings (Burr, 2003; Erickson, 2004). In this thesis, it is a descriptive concept relating to genres of communication and changes within a practice. Nevertheless, scholars have also used it to understand the flow of power in the society and to deconstruct social practices (e.g., Burr, 2003; Derrida, 1967/2001; Foucault, 1969/1972; Jones, 1993).

The papers are printed in this thesis with permission from their publishers. The final chapter, the epilogue, follows the summaries of the papers. Its function is to take the hitherto discussion of this commentary text and the following papers to a higher level. However, here come the summaries of the papers.
Paper I: Ett deltagande för alla? En kritisk diskussion

An early draft of this paper was presented at a conference in 2002 (Jaldemark, 2003). Later, in 2004, I was offered to write a chapter in a trilogy discussing online learning communities (Jobring, 2004; Jobring & Carlén, 2005; Jobring, Carlén, & Bergenholtz, 2006). Therefore, the ideas published in the early draft went through extensive revision, and was published in the second volume (Jobring & Carlén, 2005) of the trilogy. This paper serves as an opener to the field of inquiry that this thesis embraces.

The paper aims at discussing aspects that affords and constrains participation in computer-based education. From the participants perspective the paper elaborates on the conditions for participation in such educational settings. Specifically, the paper starts to discuss aspects of access to online education. This argumentation involves issues of tool-design, the participants’ socio-economical character, and the organisation of education. Thereafter, the discussion extends to aspects related to computer-mediated communication. This extension comprises differences between communication in online settings and physical settings, aspects of loneliness and collaboration online, and issues related to the flexible character of computer-mediated communication.

The paper concludes by claiming that online participation in educational settings is a complex phenomenon where the conditions for participation vary for different participants. The analysis reveals that both individual as well as structural aspects are important for understanding the conditions for participation in these settings. It is emphasised that participation links to aspects that have both individual and structural character. Understanding online participation in educational settings needs to take into account that the responsibilities for the conditions of participation lie both within the single participant as well as with the educational organiser. The resulting participation is an interplay between participants, the society, and the tools used in the educational setting. This interplay embraces aspects of class, gender, and ethnicity, as well as experiences, knowledge, and language. These aspects both afford and constrain participation in educational settings. Finally, the power over participation in educational settings is put into practice in the life situation of the participant and effects both their possible participation as well as their future opportunities.

Published as:
Paper II: Changes within the practice of higher education: Participating in educational communication through distance settings

This paper was the last I wrote. Originally, some of these thoughts were discussed at a conference in late 2006 (Jaldemark, 2006). Overall, this paper discusses questions of CMC in educational settings from a historical perspective. Particularly it is about changes within the practice of higher education. These changes relate to how students and teachers perform educational communication in distance settings. This communication is analysed and described in terms of different dialogical intersections. These intersections embrace the tools used in educational communication and the locations where students and teachers are physically situated. The Swedish practice of higher education illustrates such changes in the participation in educational communication. In short, the number of dialogical intersections has increased between the years around 1990 and nowadays, and the use of tools and locations has also changed during these years. This is visible both in the discourse and in the practice of higher education.

However, one important difference is the location of the educational communication. Earlier, students and teachers mainly communicated at either campus or local study-centres, or through tutoring sessions between a single student at home and a campus-based teacher. This communication embraced a limited number of intersections, and it included physical meetings and tools such as letters and telephones which supported one-to-one communication.

Since the years around 1990, the number of potential intersections in higher education has increased. The main source of these new intersections has been tools linked to computers such as computer conferencing, videoconferencing or learning management systems comprising a cluster of communication tools. Collectively, these tools extend possible ways to communicate between one-to-one, one-to-many and many-to-many agents. Further, these tools also extend possibilities for communication within the same category of location. At the same time the increasing number of tools, and the ways in which these tools are used, have blurred any assumed sharp distinctions between the locations of the distance settings. This increase has also extended not only the amount but also the form of contact between different locations such as campus, local study-centres and homes. Such tools support students working together in groups, enhancing earlier contact based on physical meetings and/or one-to-one tutoring. In short, these changes have augmented the ways which students and teachers engage in a central educational feature – the meeting of minds.

Finally, this paper questions whether the distinction between distance, face-to-face and online education remains meaningful. The earlier so-called distance settings have been transformed, merging with online settings. Nowadays tools
such as computer-conferencing, which were earlier used mainly in online settings, are frequently used in both distance as well as face-to-face settings. The differences between courses and programmes using online or distance settings are therefore more superficial, merely a function of the description, labelling, branding, publicising or marketing of courses. A distinction between distance, face-to-face and online education may therefore no longer be useful. These three are not different domains of education, they are just different settings used in the practice of higher education. Any course or programme may embrace more than one of these settings.

Published as:

Paper III: Sharing the distance or a distance shared: Social and individual aspects of participation in ICT-supported distance-based teacher education

This paper was co-written with two colleagues Ola J. Lindberg and Anders D. Olofsson. A draft of the paper was originally discussed at a Scandinavian/Asian Pacific conference June 2004 (Jaldemark, Lindberg, & Olofsson, 2004). It is about ICT and participation. It aims to contribute to the discussion of social aspects of students’ participation in online settings. However, of particular interest is the possibility of participation in a teacher education program with an integrated online setting. The purpose of this paper takes as its point of departure the changed conditions of the Swedish system of higher education. Following this departure, the paper includes an analysis of students’ participation in distance-based teacher training in which students perform collaboration, learning, teaching, and sharing of resources through computer-mediated communication. This study emphasised aspects related to students’ relationships with each other.

The paper contains some early results of a philosophical hermeneutical study and the main results are reported by Lindberg and Olofsson (2005). Data were collected by interviewing 19 students, who had been using ICT in their teacher training for more than two years. Interpretations about student participation were made based on three perspectives on participation – social constructivist, social constructionist, and sociocultural – and the divergent assumptions these perspectives entail.

The findings of the study indicate that students participate in distance-based teacher training in such a way that their participation is not part of a social, but rather, an individual process of learning. The findings suggest that there is a
need to be more explicit about expectations inherent in the use of online settings in higher education and, in addition, that the current design of such settings for collaboration and learning challenges future educationists.

Published as:

Paper IV: Participation and genres of communication in online settings of higher education

While starting this paper with an idea in 2004, I had the intention of discussing it at the EARLI-conference 2005. Unfortunately I had to postpone this plan. Instead, an early draft was discussed at a conference in late 2005 (Jaldemark, 2005b). However, after developing the ideas of the paper during 2006-2007 it was finally published in 2008.

This paper focuses on written utterances in online settings of higher education. It concerns the constitution of the initiation, turn taking and the steering of exchanges of utterances; and it describes these patterns in terms of different genres. The study also concerns participation in higher education and, specifically, participation in educational settings where students and teachers rarely meet face-to-face. Their participation is thus dependant on written utterances in online settings. Overall, this paper discusses constitutive aspects of these written utterances.

The paper is a report from a case study of a full-time five-month university course using online settings. The study embraced utterances, such as study-guides, syllabuses and postings exchanged in the educational communication between fifteen students and three teachers. The analysis raises issues that link their communication to the heart of education, the steering of participation and the power relationships between students and teachers in online settings. The utterances are analysed using Bakhtin’s theory of dialogue (1935/1981, 1953/1986) and Lotman’s (1988) notion of the dual functionality of utterances: dialogical and univocal. Students’ and teachers’ participation in the online settings is interpreted in terms of genres of communication.

The educational communication embraced both teacher-centered and student-centered genres. The distinction between these two genres relates to the functionality of the utterances, the main metaphor for learning and the responsibilities for the communication taken by students and teachers. The emergence of these genres seems to be affected by interplay between the
composition of the study-groups, the structure of the task and other aspects of communicating through computer-based tools in online settings.

Published as:
In retrospect: The heart of the thesis

The general intention of this thesis has been to understand how participation in the activity of education relates to communication and tools. In fulfilment of this purpose communication, education, and tools have been analytically linked by a common denominator: human action. The commentary text at the outset of this thesis expounded on these links, while the included papers illustrate how these links operate in educational settings. The general purpose – participation in the activity of education – also serves as a frame for a narrower purpose: discussion of participation through computer-mediated communication in online settings of Swedish higher education.

This thesis embraces four research questions. ‘How can the activity of education be conceptualised in terms of educational settings?’ is the first question and served as a frame for the other three questions. How does participation relate to the activity of education? How do tools relate to the activity of education? And how does communication relate to the activity of education? The answer to the first research question shows that reference to educational settings requires discussion of education as a dynamic whole. Accordingly, none of these questions can be answered separately. They need to be answered together since the concepts they embrace are inseparable in the practice of education. Therefore this epilogue discusses them as being aspects of a whole.

In the introduction to this thesis a conceptualisation of participation in education was introduced. This question was reviewed in terms of the relation between participating in education and the environment. While education involves human action, understanding of the relation between participation in education and the environment also requires a theory of human action. Here this theory assumes that man is inseparable from the environment. This assumption has further implications for conceptualisations of educational participation. Therefore, the concept learning environment, frequently used in conceptualisations of education, can be challenged as being problematic for reaching a coherent understanding of such participation. The problems of the concept of learning environment were introduced and educational settings were proposed as an alternative concept. In this epilogue, these general issues will be revisited in the light of the transactional argumentation of the included papers and the commentary text. This discussion will start with revisiting the relation
between participation in education and the environment. Thereafter the analysis incorporates online features. The discussion then turns to how lessons learned from the papers and the commentary text show that participation in education is understandable as a complex boundless transactional phenomenon. Finally some consequences of this boundless participation in the activity of education close this thesis.

Education and environment revisited

As discussed in the second chapter (see also Jaldemark, Lindberg, & Olofsson, 2005a; Lindberg & Olofsson, 2005), any discussion about understanding participation in education depends on ontological assumptions. This is also true if we should understand the relation between participation in education and the environment. Ontological assumptions, that is, embrace claims about how man relates to the environment. This thesis claims that the relation is non-dualistic; man and the environment are both aspects of the same whole – across time as well as space. Such relation is discussed from a transactional approach. This means that the relation between man and the environment is embraced by an emerging and dynamic whole: the activity of education.

Accordingly, dualistic assumptions which separate humans from their environment are weak. From such dualistic assumption it follows that actions, activities, agents, communication, education, environment, participation, settings, and tools are separate elements that are understandable without reference to each other. Nevertheless, from a transactional approach the dualist separation of man and the environment is unreasonable if a more coherent and dynamic understanding of participation in education is sought. If we want to understand a moment of action, these elements must be seen as aspects of a common whole which depends on each constituent for its definition and meaning.

A second consequence of this dualism is that the environment is chopped up in different pieces. Subsequently, agents are simultaneously performing actions in different environments, such as geographical environments, learning environments, physical environments, psychological environments, and social environments. If we make this assumption, we also accept a fragmented view of participation in education.

The difference between tools and learning environment

If we accept that education is an activity which can be discussed in terms of different environments, we could discuss participation in educational practice, for instance, in terms of online (OLE) or virtual learning environments (VLE).
Yet, following the argumentation above, such an approach will lead to the same dualistic tension that is faced by other conceptualisations of participation in education, including use of the catch-all term ‘environment’.

One bridging idea is to suspend discussion of different environments and, instead, link participation to tools, objects, things, or technologies such as computers, languages, and knives. This conceptualisation embraces technologies and agent as intrinsic to the OLE. Therefore, the existence of such OLEs presumes a technology. A technology that needs to be up and running for the OLE. Nevertheless, these technologies do not exist on their own. Without them, such environments would not exist nor could they be created or shaped. Outside the technology these OLEs could not appear as a distinct aspect of the environment. This serves as a reminder of the problematic ontological status of these environments. Indeed, it makes the concept OLE unnecessary; instead the concept technology is more appropriate.

However, if we argue that the OLE is not the same as the technology we must at least admit two things; first, that OLEs are totally depending on the technology for their existence and, secondly, that these OLEs also needs reference to the agents that use the technology. If we take a closer look at the implementation of the OLEs in the Swedish practice of higher education, we will see that these environments embrace different technological solutions to support communication between agents and to facilitate these agents’ performance of different actions. In this thesis, the included papers and the reviewed research discuss some of these solutions focusing on how technologies such as chat, computer conference, e-mail, and video conference support different aspects of participation in educational communication (e.g., Berglund, 2005; Hrastinski, 2007b; Jonsson, 2004; Karlström, 2009).

Nevertheless, both in an international and national perspective, such assemblages of technological solutions are typically discussed in terms of learning environments, learning management systems (LMS), virtual platform and so on (e.g., Björck, 2004; Leijen, Lam, Wildschut, Simons, & Admiraal, 2009; Mattsson, 2009; Moreno & Mayer, 2007; Paulsen, 2003; Östlund, 2008). However, if these OLEs, LMS or platforms are understandable as something other than the technology itself, reference must be made to the agents that use the primary technology. Nevertheless, a consequence of the reviewed research and the results from the papers is that the distinction between OLEs and tools is not possible to make. When used by an agent the OLE becomes a computer-based mediating tool for communication and participation. In other words, what we call learning environments cannot be distinguished from the concept of tools. The OLE becomes a tool used by the agents. Or, as Lillevold and Dysthe (2008, p. 80) suggest, communication is “text production with a VLE as a mediating tool”.
To conclude: it is more appropriate to discuss the above-mentioned technological solutions in terms of tools instead of learning environments. In online participation these tools mediate agents’ communication or, expressed in other terms, these tools are an aspect of computer-mediated communication (CMC) in educational settings.

Prospects for designing and researching boundless participation in the activity of education

To avoid dualistic claims in discussions of participation in educational communication, we need boundless conceptualisations of participation in education that goes beyond building on assumptions such as a separation between man and the environment or a division of the world into various environments. This thesis proposes a non-dualistic view that builds on understanding education as an activity that operates in settings that are deemed to foster learning. This activity incorporates a common whole: actions, agents, communication, educational settings, and tools. An understanding of each of these aspects can only be achieved in the light of other aspects. The four papers extensively illustrate this dialectic. The review of relevant research of participation and CMC in educational settings of higher education identifies three different themes emphasised in Swedish doctoral theses: features of the agents’ that use CMC, collaboration through CMC among these agents, and design for participation through CMC in educational settings. These three themes will in the closing chapters of this thesis be unfolded in the light of the general research approach and the results from the four studies. This discussion will also embrace prospects for designing and researching boundless participation in education.

Earlier Swedish studies of the agents’ that use CMC in educational settings emphasises the importance of understanding how participation relates to the conditions of the individual (e.g., Johnsson, 2009; Jonsson, 2004; Keller, 2007; Olsson, 2007; Wännman Toresson, 2002; Östlund, 2008). In the first paper this question is in focus. The discussion in that paper emphasises that different conditions influences the agents’ possibilities to gain access to education and to participate in education through CMC. However, as Olsson’s (2007) study shows issues of access and skills are of less importance. Nevertheless, as the results from the studies of this thesis suggest, the issue seems to embrace more complexity. As shown in the studies of Johnsson (2009), Keller (2007) and Wännman Toresson (2002) personal conditions of the agents are important for participation in educational communication. Jonsson (2004) add another feature to the complexity of educational communication, how tools relate to content and to characteristic of the agent. These scholars’ discussions of such
issues are, in the first paper, extended to also include psychological characteristics of the agent.

Moreover, to meet the complexity of participation in computer-based educational communication we need concepts to analyse the agent’s participation. In this thesis such complexity is discussed by using concepts with an intersectional character. Such concepts afford complex transactional analysis of the participation. An example of such analysis is shown in the second paper. That paper focuses on how tools and the locations of students and teachers intersect, a phenomenon here called dialogical intersections. That particular discussion shows how communication in educational settings has changed in recent decades. This change is dependent on the tools chosen for communication as well as the locations of the agents. The conditions for participation range between different educational settings, for example dialogical intersections in correspondence teaching are less complex than the intersection of educational settings where students and teachers can communicate many-to-many across time and space using computer-based tools. The concept dialogical intersection was useful in the analysis of changes in the conditions of participating in educational communication within the practice of higher education. Overall, such transactional concepts with an intersectional character afford a boundless analysis; that is, an analysis where different aspects intersect and are assumed to be inseparable. Such analysis show that changes within educational practice are more complex than what is affordable within demarcated interactive approaches: that is, approaches that focuses on changes within separated single categories, such as the categories of technologies and locations.

Participation in collaboration through CMC in educational settings is another theme in Swedish research of higher education (e.g., Björck, 2004; Hrastinski, 2007b; Lindberg & Olofsson, 2005; Malmberg, 2006; Mattsson, 2009; Reneland-Forsman, 2009; Svensson, 2002; Wännman Toresson, 2002; Östlund, 2008). As Mattsson (2009) discuss, students’ participation can be categorised in terms of cooperative, collaborative, and hybrid models of participation. These models arise from earlier studies of participation in Swedish higher education. Despite its label, the cooperative model emphasises that students relate successful learning to their individual endeavours and to their individualistic assumptions about learning (e.g., Olsson, 2007; Östlund, 2008). This is confirmed even if participation through CMC includes online-based group work (see also Papers III-IV; Jaldemark, Lindberg, & Olofsson, 2005a). In this work, the group is merely a tool in the performance of the particular tasks (for an extended discussion see also Lindberg & Olofsson, 2005). In the third paper it is shown that participation within the study-group is subordinated to the individual’s own needs and their culturally, ecologically, historically, and socially influenced conditions. Further, students did not define
participation through CMC as being important for participation with other students. These students assumed that the physical meetings on campus guaranteed participation with other students. Therefore, this paper emphasises that awareness of surrounding conditions is important to reaching an understanding of how students participate through CMC in educational settings. In particular, how student characteristics and their home settings may transform their participation (see also Papers I, IV; Jaldemark, 2005c). Other studies emphasise collaborative and hybrid models of participation (e.g., Björck, 2004; Hrastinski, 2007b; Malmberg, 2006; Reneland-Forsman, 2009; Svensson, 2002; Wännman Toresson, 2002). These studies discuss how participation through CMC could support the formation of learning communities. Results from these studies show how synchronous and asynchronous tools have a different impact on participation in educational communication.

These models of participation through CMC are influential in research on Swedish higher education. Nevertheless, to extend these studies, paper four approaches participation from a transactional perspective. The analysis in that paper focuses on the relation between CMC, agents, and curricula. That intersection was studied with the help of genre-theory and conversational analysis. The studied educational setting shows that models of participation through CMC can be discussed in terms of genres of communication. Further, within the same online course different genres of communication can emerge in different study-groups, in paper four two different genres emerged. One of these was student-centered, where students took responsibility for participating in communication using the dialogical functionality of group communication. The other genre was teacher-centered, where the students treating participation in communication with other agents instrumentally such that they avoided participation in extensive peer communication. An understanding of these different models of participation through CMC needs to take account of the curriculum, group composition, home circumstances, and so on. The result of paper four is a confirmation of the appearance of different models within the same course (see Mattsson, 2009). Nevertheless, Mattsson discussed participation through CMC from what, in this thesis, is called an interactive approach. Her study, like many other studies (e.g., Anderson, 2009; Jonassen & Land, 2000b; Merriënboer & Kirschner, 2007; Rhode, 2009; van Raaij & Schepers, 2008), builds on the idea of a student-centered virtual learning environment; that is, a learning environment that is shared among all participants. This thesis, however, rejects the idea of unitary learning environments. Instead that concept is replaced by the more flexible idea of educational settings.

A third research theme found in Swedish theses was design for participation in education through CMC (e.g., Berglund, 2005; Karlström, 2009; Mattheos,
These studies focus on aspects such as assessment, feedback, information-seeking, task-design, tools, and the time and locations of participation through CMC. Of these scholars, Karlström (2009) emphasised an issue that relates to the other aspects studied in this theme: the importance of being aware of how the choice of tools affords and constrains participation through CMC. This conclusion is also discussed in the first paper. That paper also emphasises that educational settings deploy tools that are primary designed for other settings. Therefore, in design of educational participation we must “ensure that pedagogy exploits technology, and not vice versa” (Laurillard, 2009, p. 6). This design needs to start with an educational problem, not available technologies. Relying on a technology to solve an educational problem is always vulnerable to the consequence that “if we are always technology-led we get sub-optimal solutions” (Laurillard, 2008, p. 139). To get an optimal solution we need to focus on the educational problem. Such a problem might be how to secure high-level participation among the students. What in terms of access would be an appropriate tool? Recently-emerged technologies such as Podcasting, Second Life, or Wikis might not generally be appropriate tools for such problems. In some cases the optimal solution might be a telephone-conference. In design of education the educational problem needs to govern the choice of suitable tools for participation.

In one of the studies that emphasises issues of design, Berglund (2005) claims that participation through CMC must be discussed in terms of a whole. However, the whole in his study is not the same as discussed in this thesis. As in the case of Mattson (2009) he discusses education in terms of learning environments. However, as the discussion in this epilogue shows, there are problems related to uses of this concept in design and research of education. This is also examined in the second paper: how location and tools relate? And in the third paper: how students de-emphasise the importance of computer-mediated participation? These discussions illustrate generic design problems around building LMS, OLEs or platforms and discussing education in terms of communication and participation within OLEs. Participation in education is far more complex than the introduction of ideas about of learning environments might suggest. Conditions from other settings, such as the home setting, and the use of other tools (e.g. telephones) for supplementary communication and participation need to be taken into account in order to understand the transfer of meaning in education.

Moreover, the studied online course of the fourth paper unveiled the emergence of two different genres of communication. This emergence reveals two problems relevant to a challenge of conceptualisations of participation in education that build on learning environments. The first problem is whether these different genres arise from the same learning environment. The second
problem is about the design of learning environments. These two problems merge in the problem of designing learning environments with educational motives. The above-mentioned course consisted of a well-considered design. The teachers worked out a detailed plan before the introduction of the course. They provided students with a study-guide that described tasks, assessments, tools, and the expected participation. However, if we discuss this plan in terms of a learning environment, the findings of the fourth paper reveal problems of linking this learning environment to the achievement of preferred outcomes. How, for instance, can we explain how different outcomes – described as two genres, emerged in the same learning environment. This result makes it hard to discern the boundaries of the learning environment and other environments, such as the students' home environment. In effect, the learning environment becomes a boundless feature in the design of education. Principally it will be the same as the general conceptualisation of the environment discussed in this thesis. Therefore it becomes an unnecessary and redundant idea. Avoiding a false extension of the learning environment (e.g. to include the home environment), still leaves open the possibility of separating students from the educational organiser. Unfortunately, this separation leads to a naive reductionist understanding of participation in education. Implementation of approaches building on the idea of learning environments will limit the application of CMC in Swedish higher education if it leaves out important aspects of the agents and the environment in the process of design. It leads to a fragmented understanding of participation in education that constrains learning and teaching in online courses.

As a fruitful alternative, this thesis proposes discussing participation in education and the design of such participation in terms of being performed as a boundless activity that operates through educational settings. It will explain and allow boundless phenomena in education, for example the emergence of two different genres in the same course. Such phenomena is a result of participation in culturally, ecologically, historically, and socially transformed tool-mediated communication that involves aspects of both the students and the educational organiser. This transformed tool-mediated communication is not compatible with a conceptualisation of participation in education that separates the agent from the environment, for example discussing such participation in terms of learning environments. However, it is compatible with a conceptualisation that builds on educational settings. In other words, it seems to be possible to design an educational setting as an aspect of the activity of education. While this activity has a boundless character, design of participation in education needs to take into account the students' home setting as these, in turn, transform both the boundless educational setting as well as the participation of students and the educational organiser (see also Papers I-IV; Hrastinski & Jaldemark, 2007;
Jaldemark, 2005c). In other words, design of participation in education is about treating its aspects as inseparable from each other.

**Consequences of boundless participation in the activity of education**

Finally, as the papers and the commentary text of this thesis show participation through computer-mediated communication in Swedish higher education is a complex boundless phenomenon. Reductionist approaches, relying on dualistic concepts such as learning environments, of this phenomenon will fail to reach a coherent understanding. As shown in this thesis, participation in education is a phenomenon that, among other things, relates agents, through their utterances, to communication genres, educational settings, home settings, curriculum content and educational organisers. Further, agents relate to participation through the tools used to mediate their participation. In online courses this is called computer-mediated communication. This means that participation in educational settings is understandable in the light of the cultural, ecological, historical, and social aspects of the agents, the tools used in communication, and the curriculum that they seek to follow. This conclusion has consequences for designing and researching participation in education.

Any research of activities with a boundless character needs an approach that suits this character. This thesis suggests working with transactional approaches of participation. To be fruitful these approaches must embrace concepts that support this boundless character. In the case of the participation in the activity of education, particularly in online courses, concepts such as computer-mediated communication, dialogical intersections, genres of communication, and online community have this boundless character since they simultaneously embrace at least two aspects of participation in the activity of education. The boundlessness of these concepts resists dualistic claims of reality and therefore makes them well-suited to describe the dynamics of participating in educational processes.

The suggestion that education must be seen as a boundless activity has consequences for participation through computer-mediated communication in higher education. One consequence is that future research of participation in education must abandon concepts associated with what Dewey and Bentley (1949/1960) called interactional approaches, for example learning environment, technology, and ICT. These concepts are sometimes used as synonyms for tools, means or artefacts. Yet a deeper look at these concepts reveals differences. As the earlier argumentation shows, the idea of the learning environment brings dualistic claims into education. It is therefore incompatible with understanding education as a boundless activity. Regarding the concepts ICT and technology, and sub-concepts such as blogs, chat, e-mail, platforms and LMS, they cannot
be understood in education as stand-alone concepts. They are only understandable as an aspect of educational phenomena when they are in use. In other words, they need to be rethought as tools.

The papers in this thesis include analyses that comprise the above-mentioned kinds of transactional concepts. Additionally, the discussion can include the concept of online communities. This concept is briefly discussed in this thesis. Nevertheless it involves transactional thinking while participation in communication in online communities is inseparable from its constituent activities, agents, content, and tools. From a transactional approach we could also argue that communities are also inseparable from the setting in which they operates. This relation deserves further research attention, including general attention to educational design.

Overall, interactive approaches constrain a wider understanding of the complexity of participation through computer-mediated communication in educational settings of higher education. Conceptualisation of participation in the activity of education, like understanding of how communication and tools relate to such participation, needs an approach that can grasp such complexity. In that grasping, this thesis has successfully utilised a transactional approach. Therefore, applying transactional concepts embracing the idea of boundlessness is, I believe, a fruitful way of widening understanding of participation in the activity of education.
REFERENCES


Prop. 1975:9. Regeringens proposition om reformering av högskoleutbildningen m. m. Stockholm: Regeringen.

Prop. 1976/77:59. Om utbildning och forskning inom högskolan m.m. Stockholm: Regeringen.


