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ARTICLES

Construction of Boundaries in Teacher Education: Analyzing Student Teachers' Accounts

Cecilie Flo Jahreie and Eli Ottesen
University of Oslo

This article analyzes student teachers' interactions in different practices over a period of one semester. We use Cultural-Historical Activity theory as a theoretical framework to address how interactions at the boundaries in teacher education are constructed and made relevant to the participants when they are working on object constructions. In the analysis, we show how an object, conceptualization of goals in education, emerges and develop in interactions, and how the object's trajectory differs as the students move between practices. In the analysis we call these practices learning spheres. Our findings indicate that the participants' positions are of importance. In teacher-led situations, such as supervision and mentoring, the teachers influenced the construction of the object, whereas in group work, the student teachers pursued and explored a variety of object constructions. Meaning emerges in the dialectical relationship between activity and action, and is regulated by the enactment of rules and norms, and the division of labor. An important finding is that the student teachers' learning trajectories vary across the different parts of the teacher education program.

INTRODUCTION

This article examines how boundaries in teacher education are constructed in interactions, how boundaries are made relevant by student teachers, and how this affects their learning trajectories. Ethnographic observation is used to understand the structure of activity as well as how individual agency is part of institutional activity. We use cultural-historical activity theory (CHAT) as a theoretical framework. Studies within this approach have focused to a large degree on structural change. In the last few years there has been a move toward research

Correspondence should be sent to Cecilie Flo Jahreie, InterMedia, University of Oslo, PBox 1161 Blindern, Oslo 0318, Norway. E-mail: c.f.jahreie@intermedia.uio.no

aiming to study the mutual relationship between agency and structure in social activities. This study goes into this space by studying student teachers' changing participation across activity systems. Student teachers' learning trajectories are divided between two activity systems: the Department of Teacher Education (DTE) and the cooperating schools. The object of activity for DTEs is the student teachers' learning trajectories, whereas the object for schools is the learning of pupils. However, as teacher educators, DTEs and schools collaborate to educate professional teachers. Thus, teacher education incorporates participants, tools, rules, and division of labor from the DTE and the schools. The student teachers' learning trajectories are potential shared objects between the two activity systems. Furthermore, tools, rules, and division of labor may be shared and move between activity systems, instigating negotiations that may change their sense and meaning. Such negotiations may occur in learning spheres (see an explanation in this article) at the DTE (e.g., lectures and seminars) or in schools (e.g., teaching, mentoring, and supervision), affording different possible actions for the participants. Student teachers learn to be teachers by producing accounts that legitimize their actions in the different learning spheres. In this study we want to illuminate the ways in which student teachers interact with a variety of tasks. By analyzing interactions of student teachers' talk as they pursue tasks and account for solutions, we aim to disclose how objects are constructed and developed and how the student teachers' positions in different practices are enacted through their accounts.

Bridging the learning between the DTEs and the schools is a recurring problem in studies of teacher education. Such issues promote policy reforms intended to develop more unified learning trajectories for student teachers, possibly bridging the perceived theory/practice gap. For instance, the traditional sequences of "training" in internship periods may be extended, or transformed, through various configurations of partnership models for improving the quality of learning, where schools and DTEs collaboratively plan internship periods. In Norway, collaboration with schools to develop internship practice was an essential part of a national initiative in teacher education, the PLUTO project (2000–2004). At the Department of Teacher Education, University of Oslo, the partner schools (rather than individual mentors) are required to take responsibility for the organization of the internship, based on guidelines developed by the DTE. However, a survey conducted by the Norwegian Ministry shows that universities and colleges continue to develop plans for internship without cooperation with schools. University teachers visit schools infrequently and, during internship, the school mentors take responsibility for planning and organizing the internship. Despite new models of partnership, the survey indicates that the division of labor between departments of teacher education and schools has not changed significantly. We raise two empirical research questions that are related to the context we study: First, how do the participants construct the object across learning spheres?

In Norway, goals in education are stated in the National Curriculum (NC). Such goals are often general and must be translated by teachers into objectives and targets for their work. To answer our research question, we conduct an analysis of student teachers' work with their understanding of "goals" as a core didactic concept in the DTE and during internship in schools. Didactics concerns theories of teaching, seeking to theorize and explain the *what*, *how*, and *why* of teaching (Loughran, 2009). By focusing on the participants' accounts in the object construction, we can explore how institutional aspects, as tools, rules, and division of labor, are made part of their talk and action.

Second, how are the boundaries in teacher education constructed and made relevant in social interaction? The boundaries are part of the activities and have evolved over a long period, but they are also enacted and made relevant in interaction. We argue that it is not enough to study the collective level between activity systems to understand boundaries; boundaries need to be studied in the interaction between individual participants. In this study we are concerned with how boundaries in teacher education are accounted for and which limitations and opportunities this creates for student teachers' learning trajectories.

RESEARCH ON TEACHER EDUCATION FROM A CHAT PERSPECTIVE

There is much research on teacher education; however, only a few studies use CHAT. A group of Finnish researchers studied boundary crossing between school and work, using an interventionist approach, in vocational teacher education, occupational therapy education, and a training program for nurses. In these research projects, the researchers design learning tasks to promote communication and learning between activity systems. In two of the studies, the researchers developed a model of a learning studio as a space for communication between student teachers, teachers, and practitioners (Konkola, Lambert, Tuomi-Gröhn, & Ludvigsen, 2007; Lambert, 2003b). The studies just presented focus on the structural aspects of human activity, whereas other studies using a CHAT approach focus on the possibilities for acting in particular situations (Roth & Tobin, 2004). As a response to the problems teachers experience because of the gap between university courses and the lived experience of their work, these studies describe and explain developmental work focusing on university/school collaboration in teacher education. In the coteaching model, university researchers, supervisors, teachers, and student teachers all engage in teaching, resulting in profound learning experiences for all.

A series of studies of reform in teacher education in Norway used CHAT to study innovation and learning in the PLUTO project (e.g., Jahreie & Ludvigsen, 2007). Findings show how a portfolio assessment scheme was developed as a powerful object that cut across institutionalized boundaries, allowing for the production of new cultural patterns of activity. A study focusing on the use of how student teachers practice teaching with information and communication technology indicates that the availability of new digital tools does not automatically translate into new practice; rather, practice emerges in the interplay of tools, institutional traditions, and students' and mentors' agency (Ottesen, 2006a). In a study of institutional change in the PLUTO project, it was found that principles of design, ideas, and models of reform are enacted in local contexts, interpreted, and transformed (Rasmussen & Ludvigsen, 2009). The authors argue that focus needs to be directed at the negotiations that occur between policy, models, and practice.

Studies on initial teacher education in England indicate that learning in internship is guided to a large degree by school policies and practices: lesson plans, curriculum delivery, and how to take the children through the curriculum. Consistent with these studies, a study of mentoring in Norwegian teacher education shows how, in mentoring, the content of talk centers on delivery of the curriculum and that the traditions and practices of the institution are intrinsic in the discourse (Ottesen, 2006b). However, institutional traditions are flexible and in constant transformation, leaving room for individual subjects to conform to, adapt, or question the existing practice.

The studies reviewed put emphasis on student teachers' school-based practice, or on what happens at DTE. In general, research on teacher education has paid scant attention to how the

transition between the DTEs and schools are managed. Studies of boundary crossing between DTEs and schools provide important evidence on how student teachers, teachers, and practitioners develop a joint object to work on when the researchers create a space for collaboration at the school site (Lambert, 2003b). In this article, however, we study patterns of interactions in naturally occurring practices, or learning spheres, between activity systems. Although the boundary crossing studies mainly focus on the structural aspects of boundaries, our aim is to explore how boundaries are constructed in interaction and how this creates limitations and opportunities for the student teachers' learning trajectories. In our study, boundaries are defined through the relations within and between activity systems; they are dynamic and evolving, constructed in the situated negotiation of the tools, rules, and divisions of labor of each of the interacting activity systems.

In the next section, we discuss CHAT as a framework for studying boundaries between activity systems and how this is enacted and negotiated in dialogue among participants. We then describe our study and methodology and present an analysis of video and audio data from teacher education for upper secondary schools (students age 16–18) in Norway. We analyze how participants construct their understandings of "goals" as a core didactic concept, both in DTE and during their internship in schools. To study how the boundaries in teacher education are constructed, we explore how meanings are shaped and objects accounted for in various learning spheres. In our understanding, "meaning" arises in the relationship between action and social activity. Meanings are situated in action but they are a function of the social relation, always related to activity.

STUDYING THE MUTUAL RELATIONSHIP BETWEEN ACTIVITY AND ACTION

In the last couple of years, some CHAT research has made attempts to identify intermediate units between the levels of action and activity. Although it is warned against theoretical shortcuts (Engeström, 2008), methodologically intermediate concepts may aid empirical analyses. Student teachers' learning trajectories are organized across a number of practices, for example, seminars, mentoring, supervision, and different forms of group work. We understand these as recurring learning spheres. The spheres are subordinate to the activity of teacher education and regulated by its unfolding object, rules, and division of labor but are too diverse and shifting to be considered activity systems. We use the concept as a way to operationalize in order to be sensitive to the empirical phenomena. To investigate how interactions at the boundaries in teacher education are constructed and made relevant to the participants when working on object constructions, it is necessary to investigate participation in and across learning spheres. It is in the student teachers' engagements in the learning spheres that tools, rules, and division of labor are experienced as salient constraints or possibilities available to the student teachers' actions.

In the analysis, we investigate actions in moment-to-moment analysis to illuminate the characteristics of central learning spheres in teacher education and the relationship between these. The analysis holds explanatory power to follow the trajectory of the object and to unpack how it is mediated by institutional rules, division of labor, and tools in situated contexts. A dialogical stance on participants' accounts in and across the various learning spheres provides important insight into how the activity systems interact.

HISTORICAL AND SITUATIONAL OBJECTS

A key theoretical concept in this study is the notion of object-oriented activity. With the notion of object, CHAT seeks to understand not only what people are doing but also why they are doing it. "Why" questions can be addressed by analyzing the motives of object-oriented activities. In CHAT, object refers to two different but interrelated aspects: the historical, generalized object of the activity system and the situational, constructed object that gives direction to the (inter)action. The first is the institutional answer to societal needs (e.g., the need for professional teachers), and institutional structures, and are historically developed. The second aspect of the object is procedural and is discursively constructed. Participants have individual motives and interests for being involved in the activity, and they conceptualize and enact the object in diverse ways, resulting in differing understandings of the object within the same activity system. Such constructions are partial manifestations of the generalized object as it gives direction to possible actions. In teacher education, the objects are constructed in the learning spheres. In the analysis, we investigate how participants account for goals in education in different learning spheres. The students' understanding of goals, conceptually and as a tool for planning and teaching, constitutes their situational object construction, and needs to be understood in relation to achieving the outcome of the activity.

BOUNDARIES AND BORDER ZONES

When object construction is investigated over time and across activities, boundary is a key concept. From the perspective of CHAT, boundaries are part of activities and have historical layers. The boundaries in teacher education have evolved over a long period, along with the development of institutional practices. Boundaries are defined as "established distinctions and differences between and within activity systems that are created and agreed on by groups and individual actors during a long period of time while they are involved in those activities" (Kerosuo, 2006, p. 4). Boundaries are intrinsic to the activity system but become transparent in and through participants' talk and actions. The learning trajectories of student teachers are trajectories at and across the boundaries between DTE and school. To pass their final exams and become certified teachers, student teachers need to attain theoretical knowledge (about their subjects, pedagogy, and methods) and field experience as teachers. Boundaries appear as a terrain of both limits and possibilities for student teachers' learning trajectories. In crossing boundaries, student teachers encounter different and sometimes conflicting views; thus, processes of collective concept formation are imperative. There have been several attempts to conceptualize this "sphere in between," for example, boundary zone (Konkola et al., 2007), boundary-crossing place (Lambert, 2003a), or border zone (Kerosuo, 2006). Common among these studies is that they draw on Engeström's work on developmental work research, and use the Change Laboratory method, in which the participants use the learning tools of the laboratory setting as resources while working on work-related problems. This space is often referred to as a "no-man's-land," where participants from different activity systems meet. In our study, we use the notion of border zone, but we identify this space empirically. It is not possible to design or promote a border zone; rather, we have to observe how practice unfolds, historically and situationally. Whether it can be analyzed as a border zone depends on at least two interac-

tional aspects: the participants become positioned and position themselves to question the norms and rules of activity systems and they coconstruct shared objects. In this study we explore how the boundaries of activity systems manifest themselves in the (inter)actions of the participants engaged in object construction. We analyze interactions in the learning spheres to investigate how the boundaries are accounted for and how and when border zones emerge.

THE STUDY

This study took place at the Department for Teacher Education and School Development at the University of Oslo, Norway. There were 190 student teachers in the program when we collected our data in 2002/2003. To qualify as teachers in secondary or upper-secondary schools, student teachers must take a one-year course after finishing their subject degrees. On campus, the student teachers attend seminars and lectures in their different subjects (subject didactics) and in pedagogy (educational theory). Seminar groups have been organized to help student teachers integrate theory and practical experience. There are around 20 students in one seminar group. Most of the work is collaborative, either with the whole group or in smaller working units (core groups) consisting of four to six student teachers who work together in all their campus and internship activities.

The program is based on the idea of partnership between the DTE and the schools. The student teachers have two periods of internship: four weeks in the first semester and eight weeks in the second. In the first period, the core group as a whole is responsible for the lessons; in the second period they work together in pairs, with responsibility for one class in each of their subjects. Each school has a contact person who organizes the internship. A teacher mentor, who is also the class teacher, is assigned to the group in each of the two subjects. The mentor observes their lessons and mentors the group twice a week. When using project work as a teaching method, the mentors normally teach with the student teachers, but the student teachers are responsible for planning the work. At the end of the second internship period, the mentors write an assessment report, which is sent to the DTE.

A supervisor from the DTE visits the school during every internship period. The university supervisors are not subject teachers, but teachers of subject didactics. The supervisor in this case is a teacher in history didactics. In the first period, the visit is organized as a meeting with the supervisor, the group of student teachers, the mentors, and the contact person at the school. In the second period, traditional supervision takes place, where each of the student teachers is supervised once. The student teacher makes a lesson plan that is sent to the supervisor some days in advance. The supervisor, student teacher, and mentor have a brief prelesson conference where they go through the lesson plan. After the lesson, which is observed by the supervisor and mentor, all three meet and talk about the lesson. The lesson plan offers a structure for the supervision. University supervision is of particular interest because it is realized through the joint efforts of school and DTE, and includes participants from both sites. The principal or one of the other members of the school staff undertakes a similar supervision with the student teacher in her or his other subject. The assessment reports from the two supervisions and the mentor form the basis for the evaluation of the student teacher's practice teaching.

The Norwegian Context: The National Curriculum, Project Work, and Lesson Plan

In Norway, the NC is formulated in two parts. The *Core Curriculum* states and elaborates the general aims of schooling. According to the core curriculum, the aim of education is to "expand the individual's capacity to perceive and to participate, to experience, to empathize and to excel" (The Royal Ministry of Education, Research and Church Affairs, 1996b, p. 15). The goals in this part focus on soft skills, such as team work, project work, argumentative skills, and criticism of the sources. The second part is the NC for upper secondary education and consists of curricula for each subject. Initially, common objectives for that particular subject are stated. Such objectives are general, as in this example from social science: "Have a knowledge of concepts, models and working methods that are fundamental to social science subjects" (The Royal Ministry of Education, Research and Church Affairs, 1996a, p. 6). The next part expresses detailed objectives and learning targets for each course in the subject. In the empirical analysis in this study, the student teachers plan a project about the welfare state in the course "Norwegian and International Politics." The theme for the project is closely related to one of seven objectives for the course. Table 1 shows the objective "have knowledge of the structure of the welfare state" and the related learning targets.

As an educational practice and method, project work is often described in relation to pupil activity, group work, and the making of a special product. Project work was a mandatory method for teaching in Norwegian schools at the time of the study and was linked to both single subjects and to a cross-curriculum approach. The method is defined as a problem-solving activity, where the pupils have to carry out a piece of work from an original idea to a product, result, or solution (The Royal Ministry of Education, Research and Church Affairs, 1996b). During the course of the school year, all pupils were required to carry out at least one project in social science and history. The topic and assignments should be selected within the framework of the curricula for the subject.

A central part of teachers' work is to plan lessons. In the teacher education course studied in this project, an outline of the lesson plan is developed at the DTE and has a didactic profile. The students teachers are expected to (a) state goals for pupils' learning, (b) account for the content of the lesson (themes, tasks, educational resources), (c) account for the methods (what pupils are expected to do, what the student teachers as teachers are expected to do, and the amount of time allocated to each task), and (d) account for the evaluation (what the student teacher would focus on in evaluating the pupils' work, and how he or she would give feedback to pupils). The

TABLE 1
Objective 7: Pupils Shall Have a Knowledge of the Structure of the Welfare State and Be Able to Discuss the Future of the Welfare State

Learning targets Pupils shall	
7a	have a knowledge of the most important principles and laws on which the Norwegian welfare state is founded
7b	be able to describe the *Act relating to social services* and the *Act concerning national insurance*
7c	be familiar with the financing of the Norwegian welfare state, with its administrative structure and political administration
7d	be able to compare different welfare state models, be familiar with problems associated with the welfare state and be able to discuss different solutions to these problems

student teachers are expected to create such documents to plan their lessons during internship, and four to six of them should be handed in to the DTE. The lesson plan should be used during mentoring and supervision. The national curriculum, project work, and lesson plans are tools that traverse the boundaries in teacher education allowing us as researchers to track the notions of the tools within and across learning spheres.

ANALYTIC APPROACH

The data analyzed for this article were produced as part of a larger study, which is built on extensive observations over one school year. One group of four student teachers was observed on campus in their courses in pedagogy, history, and social science, and two groups of student teachers were observed in their two periods of internship. Actions are influenced and structured by the activity system but not determined by it; they are always collaboratively negotiated. Our interest is in how the boundaries in teacher education work as both limitations and possibilities for student teachers' learning trajectories. We use interaction analysis to study how participants orient themselves toward the object and how historical norms, values, and the division of labor are enacted in the interaction. The analyses of the participants' interaction were conducted in three steps. First, to be able to carry out an extended analysis, we made an overview of the total corpus of data (100 hr) that made it possible to select a subset. We selected border encounters in key learning spheres and focused on situations where student teachers were working with their notions of what the goals should be in planning project work in their university courses and in internship. The data used in this study are from the second and last semester of their course (three months) and consist of video and audio recordings from seminars in pedagogy (three hr), university supervision (four hr), planning project work in internship (four hr), and mentor meetings (five hr). Second, we conducted an initial analysis of all the interaction data to identify recurring patterns of interaction in the key learning spheres. Finally, to explore and understand these learning spheres in more depth, five selected extracts of participants' interactions were analyzed in detail. The extracts were transcribed from Norwegian to English. To capture the student teachers' learning trajectory, the extracts we selected from internship were from the same group that we observed on campus, and all extracts are chronological. Table 2 gives an overview of the learning spheres included in the analyses in this article, when each episode is taking place, and who the participating actors are.

The extracts have been selected for three reasons. First, they display recurrent patterns of participants' interactions in the different learning spheres. Second, they make it possible to explore and understand how the boundaries are enacted and made relevant in the various spheres. Finally, the selected extracts allows us to explore the dynamics of change in activities.

To help us in the empirical analysis, we use "accounts" and "positioning" as analytic concepts. This enables us to investigate how the boundaries are maintained, questioned, or transformed. Accounts refer to forms of talk and actions where participants make their ideas, understandings, options, agreements, and disagreements available to each other. Accounts relate to the participants' experiences but also to explicit and implicit norms and rules within the activity. By being sensitive to how the participants' produce accounts, one can explore how institutional aspects are part of their talk and actions and how boundaries manifest themselves in the interaction. To study how the boundaries of the activities of DTEs and schools are constructed,

TABLE 2
Overview of the Learning Spheres.

	Working sphere	When	Who
Extract 1	Seminar in pedagogy	Before second internship	University teacher Group of students
Extract 2	Group work in pedagogy	Before second internship	5 students
Extract 3 & 4	Planning project work	During second internship	2 Students (Geir and Kris)
Extract 5	Supervision	Middle of second internship	University teacher (supervisor) Geir and Kris Mentor
Extract 6	Mentoring	Towards the end of second internship	Geir and Kris Mentor

we analyze how the participants produce accounts for maintaining, challenging, or transforming the prevailing boundaries. For the participants the accounts are usually implicit, and various linguistic means are used in social interaction.

In the extracts that follow, participants' contributions are analyzed to make patterns of interaction transparent. This allows us to investigate if, and how, accounts differ across learning spheres, and how the student teachers' positioning within learning spheres may influence their accounts. Positioning implies that the world is perceived from a certain perspective and that certain aspects of the world are visible from that particular position. Positioning reflects cultural and historical distributions of power, legitimacy, and authority but is enacted in situated actions. In other words, positioning is collectively accomplished in a discursive process where one positions oneself and the other participants. In an utterance one makes available a subject position, which other speakers may or may not take up.

EMPIRICAL ANALYSIS

The observations in the learning spheres and the initial analysis of the interaction data showed some recurring patterns of interaction. In mentor meetings, the discussions between the mentors and the student teachers are characterized by talk about lesson planning, individual pupil's motivation and behavior, and classroom management. Typically, the mentors ask for students' opinions but rarely challenge the students or open the discussions to different

perspectives on teaching and learning. In the mentor meetings, the mentors establish a supportive and caring mode of talk. Before the visit from the university supervisor, the content of the mentor meetings changes toward assessment preparation. The mentor helps the student teacher plan a lesson with a teaching method that he assumes will be acceptable to the supervisor. Building on prior experiences with the same supervisor, he may also advise the student teacher about the meeting afterward. In supervision, classroom performance and delivery are usually the themes of the talk, and the meetings with the university supervisor have an assessment focus. The supervisor sets the agenda, and the interactional pattern between the supervisor and the student teachers is characterized by the supervisor asking questions and evaluating and the student teacher answering the questions. The supervisor rarely explores the student's views and interpretations. Both the mentors and the supervisor in our study focus on didactic issues in their talk with the student teachers, but different aspects of the notion are made relevant through their accounts. The mentors focus on the NC and practical issues concerning teaching, the *what* issues, and *how* issues. The supervisor is also concerned about such issues, but he puts special emphasis on relating teaching and learning to theory, the *why* of teaching. When the student teachers collaborate on tasks, both at the university and in lesson planning at school, the interaction is characterized by discussions, negotiations, and interpretations of issues related to learning and teaching. They experiment with different ways of doing and understanding. In these talks various accounts are brought into play and justified in the interaction. In the various learning spheres the participants orient their talk and actions toward more or less explicit rules, values, expectations, and practices embedded in the particular context. Next we analyze five selected extracts of participants' talk in detail to explore and understand the recurring interaction patterns in the various learning spheres in more depth.

When planning teaching in coursework on campus or during internship, the student teachers in our study struggle to understand goals, both as theoretical concepts and as tools that might direct their actions. In the first and second extracts we explore how the object goals are talked about in the last seminar in pedagogy, before the student teachers enter internship. In Extracts 3a and 3b, two student teachers, Kris and Geir, plan projects in social science and in history. How to understand goals when planning a project is a central topic for their discussion. In Extract 4, the university supervisor challenges Geir's conception of the object, and in Extract 5, which is from a mentor meeting, the student teachers are told how one should conceive goals in the practice of teaching.

Constructing the Object

In the seminars in pedagogy that we observed, lectures are usually followed by plenary discussion and group work, allowing for the student teachers' negotiation of meaning. The following two extracts are from a seminar where the student teachers work with internship preparation. Extract 1 is from a plenary session where the university teacher presents the task for the student teachers: to construct a lesson plan. In Extract 2 the student teachers struggle to make meaning of the task. In this first extract, the university teacher explains how to write a lesson plan and how to break down goals.

Extract 1
University teacher: A lesson plan is a more demanding document, because you have to, in addition to planning the lesson, also give reasons for goals and choices within the different elements. And what

do we mean by that? Yes, you are going to show what you think about education, what you think about learning, and how you think that the pupils will learn something about this theme. In pedagogy we actually demand that you give the reasons in pedagogical theory as well. That means that you refer to pedagogical theory in your reasons. Why do you request this goal for the work? How can you defend that it is a good goal? And, first and foremost, where are the goals derived from?

After a brief talk, the university teacher asks the student teachers to work out a lesson plan in groups. She gives them a template of a plan to follow. In her talk, and supported by the tool (the plan template), the university teacher instructs the student teachers about what a lesson plan is and what they need to include in the plan: They have to formulate goals for their pupils' work, and it is essential that they ground the goals in educational theory. In other words, she accounts for the *why* of didactics. To appear accountable in this context (i.e., the activity system of DTE), the student teachers need to accommodate to certain rules (ground their selection and concretization of goals by using educational theory, reflect about goals and show their ideas of teaching and learning), fulfill certain tasks (be able to create a lesson plan) and use certain tools (the NC, which is from where the goals should be derived, educational theory, ideas about learning and teaching).

In the plenary session following the introduction (observational data, 05.02.03), the university teacher argues that the student teachers need to take individual responsibility for actions in the classroom. She draws on thoughts and ideas about how to be accountable as teachers in schools. Although she argues for the importance of grounding the goals with pedagogical concepts, the task presented to the student teachers is to use the categories of the template to make a lesson plan, not to discuss the categories. The task is general and abstract and does not offer any suggestions for how the student teachers should approach the task. Initially, the group assignment is quite bewildering to the student teachers, as is evidenced in the following extract. As we come into the discussion, Ingrid and Heidi struggle to define a hierarchy of goals.

Extract 2

[1]	Ingrid:	Are they going to work in pairs? Or in groups, maybe? I think this is a good plan.
[2]	Heidi:	Yeah, it is, but what do we write on goals, then? That is the issue here.
[3]	Ingrid:	That is a goal. [Points at the core curriculum that they have on the table in front of them]
[4]	Heidi:	Yes. But which goal is it under? That is a subordinate goal.
[5]	Ingrid:	Oh . . . Yes, under the big goal? [Reading from the core curriculum] "Stimulate curiosity and learning how to pose questions."
[6]	Fredrik:	But the goals we are listing, how general or specific are they supposed to be? I wonder about that.
[7]	Heidi:	Yes.
[8]	Ingrid:	I guess we can put up a general goal and then . . .
[9]	Fredrik:	The way I'm going to do it when I come out, I don't know at this time which theme or what we are going to do for instance in social science, but I would find something in the curriculum or look at the theme I am going to work with and then find something in the curriculum, that it is a goal that they should learn this and that about the Second World War in Norway, or . . .
[10]	Ingrid:	And then think of how you can make a lesson plan based on that?
[11]	Fredrik:	Yes.
[12]	Ingrid:	Yes, I guess that is . . .
[13]	Fredrik:	I don't know . . .
[14]	Ingrid:	Yes, I would have done it that way as well.
[15]	Geir:	I don't know about you, but I'm just going to be a teacher.

Just before this segment, the student teachers tried to figure out how to proceed with the task. Heidi argued that it was easy to make a template for a lesson plan—what was difficult was to make theoretical arguments for the goals. They eventually agreed to work on the theoretical arguments before making the template. Still, their initial discussion centers on finding a

teaching plan that could work, as we can see in Ingrid's first turn, where she asks whether the pupils are going to work in pairs or groups. Heidi confirms Ingrid's suggestion, but at the same time she directs their attention toward the task. Ingrid does not answer Heidi's question: Instead, she seems to find a suitable goal in the NC. By connecting their plans to a legitimate goal, they have fulfilled the task (Turn 3). In Turn 4, Heidi urges Ingrid to elaborate her claim. She argues that it is not enough to find a goal, they also have to understand how it connects to the hierarchy of goals in the NC. Again, her account is to the task, this time in more detail. Goals need to be qualified by elaborating why they are chosen, why they are suitable, and from where they are derived. Ingrid asks for confirmation on whether the previously mentioned goal (Turns 3 and 4) is subordinate to this "big goal" (Turn 5). Fredrik responds by asking how specific the goals should be (Turn 6). This question puzzles Heidi as well (Turn 7), and Ingrid starts to suggest a possible approach when Fredrik interrupts her. As a teacher in school, Fredrik explains, he would start with the content, then plan the lesson and develop the goals (Turn 9). Ingrid urges Fredrik to elaborate this view (Turn 10), and she agrees that this seems to be a reasonable way to develop goals (Turns 12 and 14). Ingrid's statement, "I would have done," also indicates the difference between what they have been told to do as students and what they actually will do as teachers (Turn 14). Geir, who has not been part of the discussion, suddenly joins in by saying, "I don't know about you, but I'm just going to be a teacher." By this utterance, he indicates a distance from the discussion. By using the word "just," Geir positions himself as accountable to the practical work of teaching, as opposed to the university's requirements of theory-based grounds and reasons. Thus, Turn 9 can be seen as a turning point in their conversation, where the students position themselves as future teachers rather than as students working on a task.

In the analysis of the interaction, we note a change in the way the student teachers talk about the lesson plan. At the outset, Ingrid's understanding of the task is to make a plan for the lesson. Heidi first turns their conversation to the category goals in the template lesson plan (Turn 2), and then to a question about different kinds of goals (Turn 4). There is an emerging tension between the completion of the lesson plan as an instrumental task and as a learning task for the students. The NC is a cultural tool that might supply them with the right solution, or it might serve as a tool to help them reflect on the nature of goals. In Turn 6 Fredrik aligns with Heidi's bewilderment about what a goal is; however, his account is oriented to the completion of the task ("how general or specific they are supposed to be"). However, in Turn 9 Fredrik's account turns their orientation from an issue about different kinds of goals to what they would do as teachers. Instead of referring to the task, and thus the tools and regulations of the activity of the DTE, Fredrik grounds his argument in the division of labor and the rules of schooling. In the activity of DTE, the object is to create a lesson plan and to be accountable as students they have to ground their goals in educational theory. As Fredrik sees it, however, in schools the job is not to conceptualize goals but to find some goals in the curriculum that cover the content of the lesson. The shift in Turn 9 indicates that Fredrik suggests an alternative interpretation of the lesson plan. Through his accounts of how to make a lesson plan, he positions himself as a teacher.

The ambiguity in how the objects and tools are talked about indicates that boundaries between DTE and schools are unsettled and permeable. During their meaning-making process, there is a tension between the student teachers' positions as students in the DTE and as teachers in schools. The task, to create a lesson plan, can be understood as an instrumental task (filling in the template with the correct goals); as an opportunity for reflecting on goals, learning, and teaching; or as a

practical device for teaching. The category "goal" in the lesson plan may be developed as a didactic concept, but it may also be talked about as a functional construct related to actual teaching. The student teachers solve the ambiguity by applying different linguistic registers to the knowledge domain. Although the object does not change, the realm for meaning making is different, in that the student teachers construct different object-concepts as possible alternatives for actions.

Reconstructing the Object: Transforming the Boundaries

The next two extracts illustrate how the student teachers recognize two possible conceptualizations of the object. During their internship, Kris and Geir plan and carry out two projects with their pupils: one in social science and one in history. They spend much time planning the projects, trying to decide which topics to focus on and how to attain their proposed goals for the projects. In this section, we follow Kris and Geir's trajectory over a couple of weeks. In the first extract, they are planning a project in social science.

Extract 3a

[1] Geir: I'm going to have them argue. . . . We will manage to pound the formal part into their heads, but . . .
[2] Kris: But that is also the focus of the curriculum. Above all, that is what they should know.
[3] Geir: Hmm . . .
[4] Kris: That's the dilemma.

Geir's first statement in Turn 1 indicates that he sees the main goal for the project to be the pupils' development of argumentation skills. Although learning "the facts" is also a goal, this is not considered to be the problem. In his response, Kris constructs a dilemma (Turn 4) between how to develop a project that ensures that the pupils learn the formal knowledge and learn to argue.

In this short extract, they are concerned with how to use the general goals in the core curriculum and the specific learning targets in the curricula for the subject (see Table 2) in a practical situation. The student teachers do not connect the two goals; learning the facts and learning to argue are talked about as separate processes for the pupils ("We will manage to pound the formal part into their heads"). Because they see the goals as disconnected, the student teachers struggle to ensure that both goals are attained. Their solution seems to be first to learn the facts and then to learn to argue for their view based on the facts. In other words, two accounts of pupils' learning are in play: the pupils as learners of a specific content (transmission of knowledge) and the pupils' development of argumentation skills (participation). These parallel accounts reflect different goals in the NC.

A couple of weeks later, Geir and Kris are planning a history project. They are now occupied with articulating the reason for the goals they have set for the project.

Extract 3b

[5] Kris: It is possible that Trond [mentor in history] thinks it is very difficult, what Helene [mentor in social science] says about not making it . . . get down to their level. But I think it is better to give them the challenge and keep in mind that, OK, the first priority is that they should learn the facts, but we are also in the end of, this is probably the last project in history in high school, for many of them the last project in history in their life! Then it has to be possible to "push the envelope" [his expression] a bit and say that this is the goal for this type of teaching, since secondary school in history and social science separate the chaff from the wheat, and argue with the use of historical facts. And then we can bring in the use of revealing one's sources, etc. Say that this is stuff we are going to take up later on. We say that it is important for them in their written work, if they borrow argumentation from a place, then it's important to use sources.

[They discuss which topics to include in the project for about 15 minutes before Geir turns the conversation to the goals for the project again].

[6] Geir: Our goal is that they are getting through parts of the curriculum [the textbook] and that they try out the skills that we want them to . . .

[7] Kris: Yes, and that is partly related to making arguments for choices, to differentiate what is important and argue why it's considered important, and partly to see that what one considers important changes after one's perspective.

[They continue to discuss the topics for a couple of minutes, i.e., whether their topics are too broad and difficult and what is relevant within each of the topics].

[8] Kris: Our choice has to be a request to try to get the pupils to connect this, try to get it into a context. Why this is interesting. I myself think it is fairly uninteresting to look at the infant mortality rate from 1923–1929, isolated, but if that says something about a considerable movement in the living conditions for a major part of the Norwegian population, then it is interesting in a historical context. Try to make them see the connection. What we want with this kind of project is exactly to make them see trends in Norwegian history, not singular events.

[9] Geir: Yes, I agree, but do we get them to do that with this project?

In this extract, Kris develops arguments for the project goals (Turn 5). Through his accounts, he dissociates himself from the mentors and offers his personal view ("It is possible that Trond [mentor in history] thinks it is very difficult (. . .) But I think . . . "). In the last semester of upper secondary it seems reasonable to demand more of the pupils than just reproducing disconnected facts. Geir argues that their main goal is to cover parts of the textbook and to have the pupils try out skills that they, as teachers, consider to be important. As a response, Kris specifies the skills they regard as important in the project. Kris's argument is based on the pupils' assumed learning trajectory: The pupils have been working in a project-based manner since lower secondary school in order to learn to argue, display their sources, and be able to criticize the sources. In Turn 8, Kris gives a more detailed description of their goals for the project ". . . get the pupils to connect this, try to get it into a context." The word "this" probably refers to factual knowledge, and he wants the pupils to place disconnected facts in a context and thereby see trends in Norwegian history. In Turn 9, Geir confirms that he agrees with Kris.

The object for their conversation is pupils' learning, that is, the expected outcome of the project, and implicitly they touch on learning as a concept. In Extract 3a, and in Turn 6, Extract 3b, formal knowledge and development of argumentation skills are seen as two separate learning processes for the pupils, aligned with two apparently disconnected goals in the NC. In their discussions, they explore ways of overcoming this dilemma. Kris's account is conceptually oriented: Knowledge is more than information; it implies being able to argue for one's view. In Extract 3b, Kris argues for a view of learning that connects the perspectives: Formal knowledge based on the curricula for the subject is not disconnected fragments of facts but needs to be placed in a context so that the pupil will be able to understand the significance of the facts and why historical knowledge is important. In their meaning-making process concerning their goals, which relates to the goals in the core curriculum and the goals for the subject, the student teachers coconstruct the object in different ways, and in the last part of the extract (Turns 8 and 9), a reconstructed object combining the two alternative accounts of the object emerges. However, for the two student teachers, it is problematic to write up goals in the DTEs prescribed manner as pedagogical content goals, skills goals, and formative goals, and the final utterance (Turn 9) indicates they are still struggling with how to arrange this in a practical teaching situation.

Group Work: Negotiating Positions

The analysis of our data indicates that when student teachers collaborate they pursue and explore different object constructions. A variety of legitimate accounts are used in the object construction. In group work on campus the object, the lesson plan, is accounted for both as a school task and as a practical device for teaching. In lesson planning, the analysis reveals that the student teachers initially constructed two alternative accounts, reflecting what they saw as conflicting goals. Through negotiations, the student teachers coconstruct their own understanding of what goals are and how they are connected.

The analysis of group work reveals how boundaries are constructed. In the two learning spheres, the analysis shows that the student teachers work on the object by asking questions, bringing up dilemmas and problems, and making suggestions that are supported and elaborated by the others. In the group work on campus, the student teachers are working on a task presented by the university teacher. In the seminar (Extract 1) the teacher explains, and justifies what they, as students, are supposed to do ("In pedagogy we actually demand . . ."). These accounts can be seen as a way to maintain the boundaries of DTE. In Extract 2 Heidi also accounts for maintaining the boundaries of DTE by stating what she regards as the issue in the task (Turn 2) and how they are supposed to understand the goals (Turn 4). Fredrik suggests an alternative way of creating a lesson plan. This is posed as a question (Line 6), indicating an ambiguity in the definition of the object, and as a problem (Line 9), illustrating a gap between the boundaries ("The way I'm doing it when I come out . . ."). By his account he challenges the boundaries of DTE, and his alternative idea about how to construct the object is acknowledged by Ingrid and Geir.

When the two student teachers are planning the projects (Extracts 3a and b), they bring up a dilemma related to different kinds of goals and learning processes in the NC. In Turn 6, Geir suggests that the goals for the project are that the pupils acquire formal knowledge ("getting through parts of the curriculum") *and* practice some important skills. In Turns 7 and 8, Kris elaborates what this might entail and accounts for an integration of goals. It is in the pupils' actions, as they carry out the project work, that goals concerning skills and factual knowledge are connected. In DTE the students are expected display their understanding didactic concepts when they account for the function of goals in education. As teachers in school, the student teachers are not concerned with categories or hierarchies of goals. Rather, their main interest is in formulating goals they can use as tools to plan for pupils' learning.

In their talk, the students permeate the boundaries between activity systems. This kind of talk holds the promise of facilitating transformation and change, as suggested by the utterance in Turn 9: "Do we get them to do that with this project?"

The analysis indicates that the group work, both on school tasks and lesson planning, might be important learning spheres in teacher education, because the student teachers are in a position to explore different accounts of teaching and learning across current boundaries. In group activities, there is no strong pattern of asymmetry, as in other institutional discourses such as mentoring and supervision. The student teachers negotiate positions in relation to each other. The tensions between the positions open a space for exploring the tools and objects, expressed in the construction of accounts that are fluid and provisional.

Managing Institutional Boundaries

Our data show that the lesson plan is an important tool in supervision. The plan is sent to the supervisor a few days in advance. The supervision starts with a short prelesson conversation, followed by the supervisor's and mentor's observation of a lesson. Often the supervisor will compare the written plan with what was observed, and possible deviations are commented upon and discussed. In the following extract, the supervisor has invited the student teacher, Geir, to elaborate on the goals he has stated in the lesson plan. In his plan, Geir has used the categories of pedagogical content goals, skills goals, and formative goals for the whole project period, and not just for the particular lesson. The student teacher and the supervisor discuss the skills goals that Geir had formulated in his lesson plan:

The goal is that the pupils with individual activity and group work can argue for what they think is most important in the historical period. They are going to get training in trusting and using their own skills. Their critical and analytical skills are considered central in this period (Geir's lesson plan, 12.03.03:3).

Extract 4

[1]	Supervisor:	But skills, did the pupils get any training in that?
[2]	Geir:	No, in the first lesson, I don't think there is any training of skills.
[3]	Supervisor:	Oh, yes.
[4]	Geir:	Yes, it is an practice in skills, but I don't feel that they have got so far that they actually have started working with something.
[5]	Supervisor:	But it is training.
[6]	Geir:	I can see that over time, but . . .
[7]	Supervisor:	[Interrupts] Do you see any training of skills that they [the pupils] have got, that you could have focused more closely on?
[8]	Geir:	[Hesitates] They may have, the group collaboration went very well, I think.
[9]	Supervisor:	Organization. You should have mentioned that in your plan. That is also a skill, a general, not a specific skill.

As an answer to the supervisor's question (Turn 1), Geir responds that the pupils did not train on any skills, and he emphasizes "in the first lesson." He interprets the supervisor's question as relating to the first lesson, and not to the project period. The supervisor disagrees (Turn 3), and Geir confirms the supervisor's claim, before adding that the pupils have not started working with the skills yet. When the supervisor disagrees (Turn 5), Geir elaborates by suggesting that skills develop over time. Geir seems to want to elaborate his claim further. His turn in 6 ends with "but"; however, he is restrained by the supervisor's interruption. The supervisor's question in Turn 7 suggests that Geir might have paid more attention to skills training. Geir hesitates, then answers that he thinks the pupils collaborated very well (Turn 8). In his lesson plan (lesson plan, 12.03.03), group collaboration is seen as a formative goal. Thus, this is mentioned in the plan but not focused on in the particular lesson. The supervisor's response of "organization" can be seen as a confirmation, where he categorizes "group collaboration" as organization, or as a different skill (Turn 9). However, he maintains that Geir should have mentioned this in his plan.

We focus on two aspects in this sequence. The first aspect is how the concept of goals is approached. The supervisor and the student teacher both use notions of goals as cultural tools in their talk, but their respective ways of approaching the concept indicate different accounts of skills: as goals for a longer period, or as goals to be stated for a single lesson. Geir's

account indicates a hesitation about the supervisors' accounts of "skills goals" and "skills training." He tries to argue for his account several times (Turns 2, 4 and 6) but is interrupted by the supervisor, who neither recognizes his account nor explores the concepts. The second aspect is related to how the object in the conversation shifts between the student teacher's teaching and the pupils' learning and how the lesson plan and the notion of goals function as mediating tools. Geir tries to make meaning of the concept of goal by searching for an explanation of the concept; the object is the conceptual meaning of goal. The supervisor's change of orientation indicates that Geir's account is not considered valid. Even though the lesson plan is a tool that may mediate a conceptual discussion, Geir's orientation toward concept development is not manifested as a shared orientation. The different orientations remain unnegotiated. This could be explained by the enactment of the positions of supervisor and student teacher. Asymmetry in positions between a supervisor and a student teacher is embedded in the history of teacher education; our analytic interest is in how the asymmetry is played out in the interaction. In Extract 4, the supervisor's accounts, although often in the form of questions, tend to be directives that the student teachers are expected to follow. The general function of such directives is to regulate the students' mental processes (such as thinking or attention) so that they can be mastered and appropriated by the students themselves. A function of the supervision discourse is to convey meaning adequately so that the student teachers may appear accountable as students.

Even though the school mentor and another student teacher are present during supervision, they rarely take part in the conversation. Our data show that the few places where the mentor takes part are in discussions explicitly dealing with pupils and events at the school (observation data, 12.0303, 26.03.03, 27.03.03, 10.04.03). Plausible explanations can be a lack of shared interests and experiences, the supervisor's instructions, and the supervision's double purpose: the student teachers' learning and the DTEs evaluation of the student teacher during internship. The supervisor is positioned as an expert in this conversation, whereas the mentor is positioned as expert on issues dealing with these specific pupils in this school. In the next extract, we analyze an extract from a mentor meeting.

Studies show that, in mentoring, the content of the talk centers on the way that student teachers deliver the curriculum (Edwards & Protheroe, 2004). The talk is context bound, focusing on what the student teachers plan to do or what they have done (Ottesen, 2007). Consistent with these studies, our analysis indicates that the mentor meetings seldom provide any opportunity to discuss constructions of the object. The next extract takes place near the end of the student teachers' internship, and Geir and Kris have one of their daily meetings with their mentor in social science. The mentor and the two student teachers discuss how Kris should prepare his lesson plan for a lesson that will be supervised by the school's principal. This follows the same template as Geir's plan in the meeting with the university supervisor. Before this extract, Kris has gone through the important parts of his lesson plan, and he is now elaborating his distinction between skills, pedagogical content, and formative goals (cf. Extract 4).

Extract 5

[1]	Mentor:	It is a bit difficult to make a distinction between goals relating to skills, those relating to pedagogical content, and those relating to attitudes. Because everything is interrelated, in a way it gets . . .
[2]	Kris:	I divide them here to the extent that I find it useful. It can be OK for structuring my thoughts, but I don't bother to press reality into a prescribed form.

[3] Mentor: But the goals of the subject, where do you intend to put them? You have goals for the work [the project work] and the competence goals, but you may also need to show that you see a connection between the goals for the subject and the goals for the lesson.
[4] Kris: Yes. I think that is part of the goals for the work. That's where I will refer to the National Curriculum.
[5] Mentor: But you should write them into your document.
[6] Kris: You mean that it needs its own heading?
[7] Mentor: Yes, because Ann [the principal and the school supervisor] is not familiar with this subject, and that is what you are going to make clear here, that you see . . . the goals are what direct our working day at school. And to know how to break down goals is an essential part of being a teacher. But what you do is to look in the back here [of the textbook]. We have been looking at the goals on the welfare state and then you can just find the goals that fit so you show a connection. But make sure you reduce it; you are not going to put in every goal, but it has to be a connection between the goals that you put in and how you break it down in the lessons.

This extract reveals how the concept and function of goals are interactionally developed, based on positions from different activity systems. Kris accounts for goals, from the perspective of the DTE, and takes for granted that goals are divided into pedagogical content goals, skills goals, and formative goals. The mentor problematizes Kris's distinction of goals because "everything is interrelated" (Turn 1). This can be understood as an invitation to conceptual exploration. However, instead of following up on this, Kris defends what he has done, saying, "I divide them here to the extent that I find useful," but he also accommodates to the mentor's view by saying, "I don't bother to press reality into a prescribed form" (Turn 2). The mentor turns the conversation to the goals in the NC and asks Kris where he intends to put the "goals for the subject." When she talks about "goals for the subject," she is referring to the general NC goals for social science. By saying that Kris has included "goals for the work and the competence goals" in his lesson plan, she indicates that he has mentioned the factual knowledge the pupils are supposed to learn and the skills they should develop (e.g., learning to argue). In other words, he includes the subject-specific learning targets (see Table 2) and goals from the core curriculum. This can be seen as an acknowledgment of how Kris and Geir reconstructed the object goals in their planning of the project (see Extract 3b). However, the mentor argues that the plan should include a connection between "goals for the subject" and "goals for the lesson" (Turn 3). In other words, the student has to take into account how the general goals for social science relate to the learning targets for the subject. A way of doing this (and hence appearing accountable) could be to be explicit about the relationship between the general goals for the social science as specified in the NC and the goals Kris has stated for this particular lesson. It is reasonable to interpret this as a request, even though it is posed as a question. Kris's answer, "I think that is part of the goals for the work. That is where I will refer to the NC," indicates that he does not recognize the distinction between the general goals for the curricula of social science and the goals in the core curriculum (Turn 4). The mentor follows up by explaining that Kris needs to be explicit when referring to the goals. It is not enough to refer to the curriculum; it needs to be written into the plan (Turn 5). Kris makes sure that he understands the mentor by asking, "You mean that it needs its own heading?" The mentor confirms this and explains why Kris should write down the goals for the subject in his lesson plan. The reasons are threefold (Turn 7): One reason is local and has to do with the principal's role as supervisor: She does not know the subject, and for her to understand the lesson plan, Kris needs to clarify the goals. The second is cultural: The activities of teaching in schools are regulated in society through the NC. Thus, it is vital to be explicit about the connection between the specific goals in the NC and the goals for the lesson. In his work as a

teacher, Kris is also accountable to the mandate of teachers as expressed in the NC concerning the legal responsibilities of teachers. In the last part of the mentor's utterance, however, there is a shift in her orientation when she presents a solution strategy for the student teacher: to use the learning targets developed for the lessons on the welfare state (Table 2) and find some general goals in the subject specific part of the NC that might fit. This is also the answer to the question the mentor asks Kris in Turn 2 about the connection between the goals for the subject and the goals for the lesson.

This extract reveals how the concept of goals is interactionally developed based on aspects characterizing different activity systems. In the first part of the extract, the unresolved questions from the supervision about the hierarchy of goals are brought up by the student teacher. The mentor's assigned role positions her as a mediator between the didactic and practical interests. She accounts for how to use the NC in a lesson plan and how they, as teachers, are expected to deal with the goals. Breaking down the goals of the NC into targets for their teaching is a significant part of the work of a teacher. She positions herself as a teacher mentor, where she justifies the *what* and *how* questions of didactics, thus giving the expected accounts as a student teacher educator. In the last part of Turn 7 there is an important turn in her orientation, where she offers a solution strategy ("But what you do . . ."). Now she is positioned as a teacher accounting for how teachers in their daily life resolve the challenge in a situated, practical manner. Kris reconstructs his position and chooses to be accountable to the school when engaging in this learning sphere. This can be understood as a tension in positioning. The mentor assesses the student teacher's "capability" as a teacher at the end of the internship. This aspect frames the mentor conversation and makes it easy to understand why a student teacher would choose to adjust to what is warranted in this activity.

Constructing Accounts Between Student and Teacher Positions

In our analysis of the extract from supervision (Extract 4), we showed how the object for the conversation changed between student teachers' teaching and pupils learning. In the mentoring session (Extract 5), goals are the object of the discussion. Next we discuss three aspects. The first aspect is related to the different role curriculum goals have as tools in the construction of the lesson plan at the DTE and the school. At the DTE, the lesson plan functions as a task for learning *about* goals. The student teachers, as students, have to give theoretical arguments for the goals. In school, on the other hand, the lesson plan is a tool for planning the performance of practical work in classrooms. The function of goals is to give direction to the work of teachers and pupils. According to transcripts from the mentoring session and observations from supervision (observation data 12.03.03, 26.03.03), the university supervisor has told the student teachers not to explicitly state the NC goals in their plan. The school mentor uses cultural and legal resources in her accounts of why it is necessary to include the NC goals in the plan. When the lesson plan works as a task and its function is to display the students' pedagogical and didactical knowledge to the supervisor, the goals from the NC could be implicit. The supervisor and the students all know that the NC guides work in schools. If the intention is practical, it makes sense to include the NC goals as information for the teacher who does not know them. If the purpose is to do what teachers are expected to do, it makes sense to make visible the connection to government's steering through goals, thus underscoring that the teacher is accountable in his professional practice.

The second aspect is the student teachers' struggle to open up spaces for a conceptual elaboration of the object. Instead of opening for an elaboration, the supervisor and the mentor do not accept the student teacher's account as valid from a position as respectively a *student* and a *teacher*. An important part of teacher education is that student teachers should learn to talk and act as teachers. This means for instance that they need to learn a distinct form for discourse: the curriculum discourse. This implies making use of a system of concepts such as, for example, pedagogical content goal, skills goal, and formative goal. In internship, student teachers are not assessed on their capability to conceptually interpret, but on procedural actions. This is confirmed in studies of mentoring (Edwards & Protheroe, 2004). The mentor guides the student teachers into warranted ways of seeing, representing and talking about their experiences, focusing more on their concerns for their pupils' learning than on the student teachers' learning activities.

The last aspect is related to how the boundaries are constructed. The boundaries of the activities of DTE and the school are rendered visible as the supervisor and the mentor position themselves as "experts" and control the movement in the discourse guiding the student teachers toward "valid" accounts. In the learning spheres, the university teacher and school mentor defend the boundaries of "their" activity. Our analysis shows that the supervisor defends the boundaries by giving the student teacher directives on how to conceive the object (Extract 4, Turns 3, 5, and 9). The mentor poses her accounts as statements and definitions. In Extract 5, Turn 1, she states that it is difficult to make a distinction between different "types" of goals, thus defending the boundaries between school and DTE. In Turn 3, she states the need to connect to the NC, to be accountable as a teacher in the school. Last, in Turn 7, she accounts for how to do this in practice, grounded in the situation. The institutional accounts regulate what can be talked about, who can talk about what, and when. The student teachers meet these defenses in different ways. In the supervision, Geir tries to challenge the boundaries by bringing up a dilemma in the supervisor's directive (e.g., Extract 4, Turn 4) but is met with another directive. In the mentoring session, Kris chooses to adjust to what is warranted in the activity. In these two learning spheres, the student teachers are accountable for producing talk of a certain kind. This puts them in a vulnerable situation where they have to vacillate between valid accounts of different learning spheres.

DISCUSSION

In this study we have used learning spheres as an intermediate concept to study how meaning emerges in the dialectical relationship between activity and action. With the use of accounts and positioning as analytic concepts, we demonstrate how interaction at the boundaries provides limitations and possibilities for student teachers' object constructions. The analysis shows that the accounts of tools and object constructions vary across learning spheres. This has to be understood in relation to the history of the activity. The object of the activity for DTE is student teachers' learning trajectories. The object of activity for the schools, however, is pupils' learning. Supervision is a learning sphere, with participants from both DTE and the school, and thus has the potential for boundary crossing between activity systems. However, the DTE sets the rules and division of labor: The student teachers are accountable to and are evaluated by the university supervisor. Mentoring is also part of the production of DTE; however, university teachers

are not participants in the learning sphere, and the school mentors evaluate the student teachers. The accounts in supervision and mentoring are in other words saturated with traditions of institutional argumentation and action. The tools (documents, educational goals), rules (administrative routines), and division of labor are inscribed with historical and institutional views in each of the activity systems on how to conceive the object and serve to work as authorized practices for the learning spheres. This is made evident by the way the object is constructed differently based on conflicting expectations in the activity systems. This is a conflict of purpose. In supervision, the lesson plan is conceived as a task, and *as students*, the student teachers are accountable to demonstrate that they understand the didactical conceptualization of goals. In mentoring, however, the lesson plan is constituted as a practical device for teaching, and they, *as teachers*, are accountable for making visible the connection between their teaching and the mandate for their work, the NC.

The PLUTO project emphasizes collaboration as vital in order to strengthen the relationship between pedagogical issues, subject matter, and student teachers' teaching. A central aspect of PLUTO is that the student teachers have to collectively undertake tasks and assignments set by the DTE and, in internship, they have to collectively plan their teaching. The student teachers' collaborative planning in internship is complex; they are accountable to the DTE, in terms of handing in lesson plans and university supervision, and to the school, which is responsible for the evaluation of their suitability as teachers. Although the student teachers are accountable to and evaluated by the DTE on the outcome of their group work on campus, their collaborative actions take place in a sphere outside the gaze of university teachers. Thus, issues of accountability toward the DTE may be bracketed in their interactions. Positions are therefore to a large extent based on relations and negotiated interactions, and legitimate accounts may draw on and develop accounts from both activity systems. Our analysis indicates that, in group work, both on campus and in internship, the student teachers construct the objects using accounts from both DTE and the school. Through their accounts they also challenge the boundaries in both activity systems. Based on our empirical evidence, we argue that in group work the student teachers' interactions constitute a border zone where warranted ways of understanding teaching and learning are reflected on and discussed. The student teachers act in a space where they are in a position to experiment with different forms for doing, which may erase or combine current boundaries. The student teachers act as *learners*, coconstructing meanings and changing the object in question with integrated use of different tools.

In this study, the notion of learning spheres is used in order to be sensitive to the empirical phenomena. Learning spheres are historically built into and institutionalized in the activity, and the analysis of learning spheres illuminates the relationships between the object, tools, rules, and division of labor, which differ within the activity. Using the term *learning spheres* thus captures the internal dynamics of activity systems. The main finding in this study is that different practices in the learning spheres, within one and the same activity, give rise to variations in the construction of the object. The participants' meaning production in learning spheres takes different directions and may collide. In our study, we have elucidated unresolved contradictions within and between division of labor, rules, tools, and objects.

Issues of power and conflict are aspects of negotiation that are seldom focused on in the CHAT literature. If we use position as an analytic concept, the analysis is attentive to the fact that objects often seem to arise from negotiations saturated with opposition and clashes of interests. Positions are interactionally achieved, implying that we cannot categorize a student as a

"generalized" student. How student teachers are positioned and position themselves in interaction needs to be investigated in the analysis. Our analysis shows how the university teachers and school mentors maintained the boundaries of "their" activity, and how the student teachers are positioned in relation to the teachers and mentors. In group work, however, the student teachers position themselves as learners where they challenge and transform the boundaries. These findings could be important at the level of both individual and systemic learning. For the student teachers, this is important for opportunities to construct knowledge and understanding, and for teacher education it provides suggestions for how to bring forth a border zone between DTEs and schools.

In educational policy, there is a strong urge to develop partnership models between DTEs and schools. In the studies reviewed, the Change Laboratory method is used to promote a space for communication between activity systems by designing a learning studio (Lambert, 2003b). This implies that the researchers introduce and organize new tools for improving teacher education. This is an important approach, because it gives an opportunity to optimize the agency of student teachers. However, their studies are on an intentional level, and to understand how participants cross boundaries in a naturalistic setting, we study how practice is played out over time. Our analysis has shown that crossing boundaries between DTEs and schools may be a complex challenge, as the historically developed boundaries between the two activity systems appear rigid and isolated. The closed systems are enacted in participation. Based on our findings, we suggest three implications for boundary crossing.

First, if teacher education is to succeed with partnership, then tools, rules, and objects cannot be embedded in local practices but instead have to be communicated and negotiated with student teachers and between participants from DTEs and schools. The interaction analysis in this study shows that the student teachers' learning trajectories vary across the different parts of the teacher education program. The focus for the schools is the pupils' learning, and they rarely take student teachers' learning into account. To facilitate learning at both the individual and the systemic levels, DTEs and schools need to develop the learning trajectory of the student teacher as a joint object. This could bring forth a border zone between DTEs and schools in which the learning trajectories of student teachers are explored.

Second, our study shows that student teachers are important participants for questioning and challenging the boundaries. In group work, we find that student teachers explore various knowledge accounts to construct the objects in new ways. Gatekeepers of the boundaries between DTEs and schools have to be open for student teachers' positioning themselves rather than only positioned by others.

Finally, for researchers to understand boundaries in teacher education, it is not enough to study the collective level between activity systems; boundaries need to be studied in the interaction between individual participants. As argued, research on teacher education has focused on different forms of partnerships between DTEs and schools. The focus is most often policy oriented, with the aim being to provide evidence of "what works" in order to improve programs. This gives important input to understanding these types of settings. In this study, we have demonstrated the importance of understanding institutional arrangements, such as partnerships, by being sensitive to the negotiations that are played out in and between learning spheres. We emphasize that this seems to be a key area for further investigation on the part of teacher education research.

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