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Quality Teaching and Learning as Practice Within Different Disciplinary Discourses

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This article focuses on describing the interplay between teaching and learning practices in Higher Education and the disciplinary context of such practices. In particular, it aims to address the question of how course design, teaching, and learning activities take place within a particular academic culture and how those activities mutually shape each other. To do so, we propose to use the notion of mediating actants, a combination of Vygotsky's (1978) notion of mediation with the concept of "actant" that is at the core of actor-network theory (ANT). We suggest that such a notion can be useful in understanding the processes of construction of teaching and learning within disciplinary discourses and practices. This article is based on an empirical study of three Master's programs at a Scandinavian institution of higher education. Data was gathered using ethnography-inspired methods such as interviews, observations and document analysis. In our analysis we identified six elements as central in how quality teaching and learning are constituted within master's programs: (1) the master's thesis, (2) writing as a mode of thinking (3) the students' learning environment, (4) the teaching process and teaching style, (5) the students' conceptions of learning and their engagement, and (6) the processes of transformation from spontaneous to scientific concepts that the students undergo.

What is quality teaching and learning? A substantial discussion around the meaning of quality took place around 20 years ago within the field of higher education, and views still differ about what quality is and how it should be obtained (Stensaker, 2007). It is probable that the question of what quality in education is never has had a clear, unambiguous answer, although a pragmatic consensus seems to have been reached in practice that quality means "fitness for purpose" as well as "fitness of purpose" (Wittek & Kvernbekk, 2011, p. 672). Nevertheless, the notion of quality is widely used in all educational contexts and increasingly so in the field of higher education. Most often the term is used in combinations such as *quality systems*, which is used to refer to systems encompassing different functions, aspects and levels of quality in an educational organization as a whole. Some studies of quality in education focus on the notion adoption of institutional evaluation (e.g., Hansen, 2009), others on the concept of comparability (Kantelinen & Airola, 2009), while others have a marked emphasis on learning (e.g., Mikkonen, Heikkilä, Ruohoniemi, & Lindblom-Ylänne, 2009), and others yet on the personal transformation of students or staff (Harvey & Newton, 2007). In light of such a diversity of perspectives and approaches to the notion of quality, the question of what quality in education is remains crucially pertinent.

In this article we aim to narrow the discussion of what quality is down to the area of teaching and learning in higher education. In our quest to understand what makes higher education specific among other areas of education, we have found that the notion of discipline seems to be of central significance. Although academic thinking involves a number of values that transcend disciplines, for example, academic freedom, collegial governance and service to society (Kuh & Whitt, 1986), many academic activities, rituals, and symbolisms have been described as discipline-specific (Becher & Trowler, 2001; Neumann, 2001). Academics have been portrayed as identifying strongly with their disciplines (Clark, 1984) and as embracing the culture of their disciplines in a way that evokes the workings of tribal life (Becher & Trowler, 2001). In addition, academic culture is influenced by a number of other factors, such as sub-disciplinary groupings and specializations within academic disciplines (Becher & Trowler, 2001). We propose to employ those ideas through an analytical approach that distinguishes between disciplinary discourses in our investigation of what teaching and learning quality is to teachers and students.

Our theoretical approach holds three concepts as central. The first one is *learning trajectories,* which address students' processes of appropriation of the core resources existing within the program as well as ways of acting and thinking (Wittek, 2012). The second concept is that of *mediating actants*. The notion of mediation refers to the relationship between student learning and the core resources existing within the context of learning. We choose to borrow the notion of actant from actor-network theory (ANT) to refer to the core resources used by students in their learning activities as it allows encapsulating both human resources and artifacts into one single term. The term *actant* is a neologism specific to ANT and derives from the word "actor." It is meant to refer to both human actors and non-human actors, which may be anything from physical objects like chalk and chalkboard to symbols or scientific concepts (Callon, 1986; Latour,

1996). The third concept that we draw on is that of disciplinary discourses, here conceptualized as the social systems that are operative for interpretation within program-related contexts and thus are important in understanding the students' trajectories of learning.

Our theoretical approach draws partly on ANT and partly on a sociocultural framework of mediation. These belong to two slightly different epistemological traditions that are rarely combined within the realm of educational research. Nevertheless, we believe that the concept of mediating actant may be useful in addressing the relationship between teaching in higher education and the students' trajectories of learning. Although those epistemological differences are undeniable, they do not need to be considered violations. In a comparison of cultural-historical activity theory and ANT, Miettinen (1999) argued that the two approaches have much in common as they are both "attempts to transcend the dualism between subject and object, nature and society" (p. 170). From his point of view, the difference lies primarily in how those two approaches interpret the concept of mediation: while ANT is symmetrical, with humans and non-humans constantly displacing and replacing and redefining each other, activity theory is dialectical, where the relation between subject and object is shaped through history and results from evolution that is both biological and cultural. "Although all entities of the assembly do have the power to influence, or 'act,' they are asymmetrical in regard to taking the initiative in the construction of associations" (Miettinen, 1999, p. 177).

The authors of this article have, in earlier work (Habib & Wittek, 2007), highlighted how combining ANT with theories from a sociocultural tradition can enrich a conceptual discussion and help find systematic solutions to concrete problems. We would argue that, in the context of defining quality in teaching and learning in higher education, where issues of language, discourses and power are central, the common characteristics of the two approaches transcend their differences. The philosophies they are based on are similar enough to provide a common terrain for further conceptual work, while at the same time bringing about different ideas and notions that can supplement each other. By adding the qualifier mediating to the notion of actant, we merely articulate the already underlying mediational aspects of the concept of actant, which we believe pervades the ANT literature but is too seldom distinctly spelled out.

Theoretical Backdrop

Our theoretical point of departure brings together two concepts that are rarely combined in the literature, namely those of learning trajectories, mediation, and actants.

Learning Trajectories

The concept of learning trajectories focuses on processes in which students appropriate ways of acting and thinking, as well as on the use of tools embedded in the profession or related disciplines (Wittek, 2012). This concept also captures how these experiences are interpreted and reconceptualized in creative ways, hence being transformed into structures in the students' individual meaning making (Linell, 2009; Vygotsky, 1978). Processes of exploring different experiences in relation to one another are important in the students' meaning making, as these bring together different signs, symbols and experiences into new senses of meaning (Wells, 1999). The discourses are social and historical, though a person's trajectory and meaning making are individual, thus socially formed and informed.

However, students cannot make sense of anything without a language or other sorts of representational systems such as the academic cultures that exist within the various institutions where they receive their education (e.g., primary school, secondary school, university, college). Academic cultures are made available for students by core mediational means, which may vary according to the disciplinary and professional fields covered by the studies. The student must negotiate his/her own professional learning trajectories through dialogue, partly overt, partly internal. These processes involve other people, different resources and third parties available in the related cultures.

Each student has unique trajectories through the discourse spaces they participate in during education, although the individual trajectory of learning also depends heavily on social experiences from the past and imagined future activities (Bakhtin, 1981). A student typically has learning experiences that are related to specific events, which makes those experiences particular and unique. To elaborate further on the disciplinary cultures and their potential in enhancing student trajectories of learning in specific directions, we now turn to the concept of mediating actants.

Mediating Actants

The concept of mediation is central in early sociocultural literature (Leontiev, 1974; Vygotsky, 1978). According to Vygotsky (1978), a hallmark in human consciousness is that it is associated with the use of tools, especially psychological tools or signs. People do not act in a direct unmediated way in the social and physical world. Rather, our contact with the world is indirect or *mediated* by various types of tools or mediators. Among those tools, signs play a particularly important role, as they embed communication systems organized around particular norms and conventions (Vygotsky, 1978). Signs can take the shape of

language, counting systems, mnemonic techniques, algebraic symbol systems, works of art, writing schemes, diagrams, maps, and mechanical drawing.

In his analysis of the writings of Vygotsky, Wertsch (2007) identified a distinction between two main categories of mediation. The first form is *explicit mediation,* whereby artificial stimuli are intentionally and overtly introduced into problem solving activities, for example when teachers introduce a specific theoretical model to their students (Wertsch, 2007). Explicit mediation involves "the intentional introduction of signs into an ongoing flow of activity" (Wertsch, 2007, p. 185), while *implicit mediation* typically involves signs "in the form of natural language that have evolved in the service of communication, and then harnessed in their forms of activity" (p. 185). In the context of education, implicit mediation can for example be specific ways of reasoning, procedures for finding the right answer or accepted ways of arguing within a scientific discipline. Implicit mediation is generally not consciously or intentionally introduced into a problem-solving setting. However, it often plays an important role as a meditational means used by participants of a particular culture especially for the newcomers as they start the important process of transforming explicit concepts into implicit knowledge.

Here, *disciplinary discourses* are conceptualized as social systems "operative for interpretation at a given time and place" (Gee, 2000, p. 110). Disciplinary discourses are socially and historically constituted, and the personal level of learning trajectories can never be separated from culture and context. Nevertheless, these discourses form crucial forces in how they structure learning trajectories, as they recognize particular actions, thoughts and values exhibited by the students over others.

Professional knowledge is operationalized and made available to students in the form of core resources, conceptualized here as mediating actants. These can appear as material or symbolic, in which the latter refers to objects that are heavily based on language and communication. Secondly, they can be dialogue partners that we interact with both directly or indirectly, and thirdly they can appear as third parties (Linell, 2009), which are typical ways of thinking and acting, leaning on professional practices that we tend to adopt as "how it is done." However, these different representations of epistemic objects do not have clearly defined borderlines (Habib & Wittek, 2007; Wartofsky, 1973). Disciplinary discourses are constituted by the epistemic objects brought into play in a given context, as well as from the tensions and interplays that unfold between them and their users. Students author their own meaning making in the sense of creating or recruiting some interpretation of the mediating actants that they face, and also by contrasting and comparing different experiences toward one another.

ANT provides a framework to understand human activities and social processes. One of the main tenets of ANT is that social and natural elements are inextricably intertwined. ANT proposes to abolish the distinction between the social and the natural, and introduces the principle of generalized symmetry, which stipulates that both humans and non-humans can be considered actors or actants (i.e., entities that have a significant influence on other entities). Non-human actants may be as varied as animals (Callon, 1986), urban development projects (Latour, 1996), or information infrastructures (Hanseth & Monteiro, 1997). From an ANT perspective, human and non-human actants construct each other and negotiate with each other, thereby forming heterogeneous (hybrid) assemblages that can be referred to as networks of aligned interests (Walsham, 1997). As a network gains coherence and consistence, it becomes stabilized (i.e., it works successfully as an entity towards a common goal). Another central ANT concept is that of black box and blackboxing. *Black boxes* are created when "many elements are made to act as one" (Latour, 1987, p. 131). They are ensembles of heterogeneous elements that are strong enough to be taken for granted. Some actors or actants can in a very stable network situation become obligatory points of passage, often in addition to being blackboxed. Networks can also become destabilized, for example when an actant opens the black box and starts questioning the validity of the network or the authority of one of the elements in the network.

One of the strengths of ANT is that it allows the analyst to move across various levels of organization, from the individual to the collective and back. An ANT approach may be useful when analyzing how mediating actants are designed and how they subsequently are taken into use, or sometimes ignored or discarded. In particular, an ANT approach will allows identification of the various mediating artifacts as actants in a network of teaching and learning (Habib & Wittek, 2007). It allows the uncovering of processes of enrollment of those artifacts by educators and learners. We would suggest that enrollment processes that are conscious and intentional (e.g., when an educator brings a new artifact into a teaching situation) can be qualified as processes of explicit mediation. Conversely, when an actant is identified as playing a role in a teaching process or a disciplinary context, and its role is taken for granted or blackboxed, the situation may fall into the category of implicit mediation.

The Empirical Study

The context of the study is a large research-intensive university in Scandinavia including several

faculties, each of which includes departments and centers. In order to get a broad enough variety of teaching and learning contexts, we chose to follow three Master's programs from three different departments (whose names have been simplified to ensure anonymity) over a period of one semester: the Department of History, the Department of Education, and the Department of Mathematics.

The overall design of the empirical study is an ethnography-inspired case study using three complementary qualitative methods, namely observations, interviews and document analysis. The two authors of this article worked closely together to design, plan, and carry out the research project. Given the complexity and multidimensional nature of the research question and the relative haziness of our area of research, a qualitative research approach was a natural choice in our case. We purposely chose to combine observations with interviews when gathering data for this research. In doing so, we aimed to find emerging themes that transversed the two sets of data. We also aimed at gathering a variety of data and impulses by combining the two methods. The main point with carrying out observations of the actual teaching and learning situations was to get a sense of the complex, ephemeral, and situated aspects of learning and teaching. The purpose of interviewing teachers and students immediately after the observed class or mentoring session was to gain access to their retrospective and reflective interpretation of what had happened in the teaching and learning situation.

The data was gathered through observations and interviews with students enrolled in the chosen master's programs and with staff members engaged in teaching or supervision within those programs. In each program, we approached between three and four staff members (n = 11). In a first interview, we asked them how they planned and conducted their teaching at the studied master's programs and what their reasons were for doing so. We then asked them to identify what they considered to be core teaching activities in the program. Both of the authors were then invited as observers at a number of core sessions for the course, where they gathered field notes separately.

After each observed session, we carried out a focus group interview with students that had attended the session, with each focus group comprised of two to five persons. In those interviews, the students were asked about how they had experienced the session. They were enjoined to describe their learning strategies throughout their course and explain in what way the lecture they just heard or the activities they had just carried out contributed to their learning and understanding of their field, and how this fit within the rest of their study. We also interviewed the lecturers immediately after the teaching sessions, focusing specifically on their reflections on the teaching and learning activities that were performed during the session. All the sessions and interviews were audio recorded, and all the interviews and some extracts from the sessions were transcribed. Altogether, 52 hours of interviews and observations were transcribed, amounting to 160 pages of transcripts.

The authors performed the data analysis in two steps: first individually, so as to produce our own interpretations without being influenced by each other, then jointly, so as to end up with a common analysis of the observed phenomena. The first focus of the analysis was to identify the main actants (i.e., the most significant elements in the teaching and learning processes). Particular attention was given to identify mediating actants, both human and non-human. A first categorization of such mediating actants led us to identity five broad categories: approaches to teaching, key activities, methodology and epistemology, architectural and other physical actants, and semiotic actants. We then moved on to uncover the relations between those actants so as to describe the various networks that they appeared to belong to. In so doing, we identified the mediating processes that those actants appeared to be involved in as well as core traits of the disciplinary discourses in which the students participated.

Results

In this section, we describe the degree of presence and the role of the various disciplinary discourses within the three selected master's programs. To do so, we identify the core mediating actants in networks of teaching and learning. We present our findings as three case studies, and use the various categories of mediating actants to structure our presentation.

Master's Program in Educational Leadership

A shared perspective on learning among faculty members. It emerged from the interview data that the lecturers' teaching philosophy, which our informants described as being based on a sociocultural approach to learning, is a significant actant as it was central to the way they taught and talked about their teaching. In particular, they advocated a participative approach to learning, where students were given the opportunity to develop knowledge through interaction. Another important actant in the making of the lecturers' identity was the idea of always being in development. The lecturers emphasized the need for breadth in the range of teaching methods used for the program, and seemed to consider variation and frequent evaluations as central indicators for quality.

The concept of a sociocultural approach to learning is introduced explicitly to colleagues and students as

central to the planning and realization of the program. However, interview data suggests that lecturers and students attributed different functions and meanings to this concept. Whereas the interviewed lecturers had a solid grasp of what a sociocultural approach to learning implies, the students observed in our study seem to have had difficulties comprehending the whole range of practical implications of the concept.

Teaching, supervision, and assessment activities. The next group of actants consists of the various learning activities that were implemented within the program. The lecturers reported spending much time discussing the practical implications of the embraced teaching philosophy and strove to develop and use a large repertoire of teaching methods, including workshops, cases, group work, and role play. In ANT terms, it can be said that one set of actants (i.e., the lecturers) attempted to inscribe another set of actants (i.e., the tenets of their shared teaching philosophy) into a third set of actants (i.e., the teaching activities). To some extent, this inscription was successful insofar as group activities were frequent and varied within the program. For example, much of the work on assignments was done within the realm of so-called "basic groups" that were put together by the lecturers who reported putting much work into finding the constellation of group members that they believed would give the students the best possible learning opportunities.

However, there seems to be a tension between the lecturers' ideals and their practice. The lecturers pointed out that they often fellback on a traditional model of teaching where the main purpose was to transfer information. Such a model rests heavily on using lectures to communicate information to the students, and lectures were, accordingly, given a significant amount of space on the programs' timetables. However, the lecturers affirmed that ideally, they would prefer to reduce the amount of time the students spent listening to a lecture, and they aimed to engage the students in learning activities where they were meant to contribute to discussions rather than being passive recipients of information transfer:

> There is so much I want to tell them [the students], in a way. And that can get in a way of give the students room to reflect about [the topic], discuss [it] with each other, build knowledge together, and such. It has to do with the way the teaching is organized, . . . that there is so much we would want to cover, there is so much that needs to be communicated [to the students] (Extract from an interview with a lecturer in the Educational Leadership master's program)

In ANT terms, we can suggest that the teaching practices were not always inscribed with the preferred teaching philosophy for a number of reasons. Some of the interviewed lecturers mentioned in particular that many students seemed to prefer traditional lectures rather than group activities. In that sense, the lecturers' assumptions about the students' expectations weighed much in their choice of teaching methods and were therefore an influential actant in the learning network. In light of Wertsch's (2007) distinction, we can suggest that the students' expectations and needs for traditional lectures acted as an incitement to enhance the explicit introduction of central concepts and ideas.

Master's thesis and other semiotic actants. The term *semiotic actants* refers to actants that are heavily based on language and communication. One example of such actants may be the set of theories that the lecturers introduce to the students throughout the program. Another type of semiotic actants may be the curriculum's relevance to the students' present and future work practice, or its relevance to broader societal or political issues.

Other actants of semiotic nature can be identified. The master's thesis was a central element of the program, as it provided the students with an opportunity to become better acquainted with the academic genre. For example, the process of writing the thesis was meant to allow the students to acquire a scientific language, to develop an analytic approach to problem solving, and to enter into a research mode.

An example of a semiotic actant that is meant to function as an ally for the master's thesis can be found in the form of a so-called "thesis line," which was a tool made available by the academic staff to the students in order to help them structure their work towards the master's thesis. It consisted of 13 steps, including, for example, overall theme, relevance, and aim and research question. We observed that students became seized up in the workings of the thesis line with apparently little conception of how it could be useful in the process of writing their theses. In ANT terms, it may be suggested that those students failed to translate the thesis line into an effective assistive device in the thesis writing process. They related to the thesis line as if filling it with information was a goal in itself, and they showed little comprehension of its role as an aid to achieve something else. In that sense, it can be said that they blackboxed the thesis line, and, in so doing, contributed to a certain form of alienation of the thesis line from the learning network.

Architectural and other physical actors. The architectural style of the university buildings also seems to have been an important actant. The university buildings available to the program included numerous large auditoriums, but few smaller rooms. The informants pinpoint the lack of flexibility in such a structure and its disciplinary aspect. As it is little conducive to dynamic teaching (e.g., with students

interacting in small groups), it tends to invite to keeping to traditional forms of teaching (e.g., lecturing). The architectural structure can thereby be conceptualized as an actant that was not easily enrolled as an ally to support interactive teaching practice.

One informant emphasized the use of artifacts in the classroom as "things that reflect what we're doing." Those artifacts are actants in the sense that they embodied the themes that were being taught. They were also allies in the process of getting the students to be more active. In one of the observation sessions, plastic posters designed by the lecturers with the central points of the lecture were hung in the classroom after the lecture. In addition, the same content was printed out on small paper sheets and distributed to the students.

Master's Program in History

Master's thesis and other semiotic actants. Within the Master's in History program, the thesis seems to have been the focus of much teaching and learning. Both the lecturers and the students viewed writing as a central activity, and the lecturers emphasized the importance of helping the students get a good grasp of the writing process. The structure of the thesis was considered an important step before going any further in the writing process. It was the object of much discussion among the students (e.g., "start with the end") presumably because a good structure is a prerequisite for a good master's thesis. For example, one of the main courses offered in the program took up academic norms for citation and references and other formalities that pertain to academic historical writing. It emerged from the data that the students were also meant to acquaint themselves with historical methodology, to gain an understanding of historical epistemology, and to reach a level of accurateness in their work "worthy of a historian." All three actants appear to have pervaded teaching and learning activities throughout the program.

Teaching and learning activities. Courses and seminars on writing techniques and methods for historical inquiry were offered to the students as kinds of building blocks to improve the skills they needed to fulfill the requirements of a thesis. Two of the observed lecturers use extracts from submitted student work as illustration of both what quality work can be and also what can be problematic in written work. In addition, related academic activities such as publishing in a student journal or presenting research work at conferences and seminars were both encouraged by the staff and valued by the students.

Several strategies involving unusual artifacts were used within the Master's in History program to help the students to appropriate the necessary knowledge to carry out their activities as historians. Among those were the use of music, song texts, texts from the literature, pictures, and role playing exercises. The lecturers also emphasized the role of other educational strategies such as travelling to places outside the university in order to get the students more directly acquainted with historical artifacts relevant to the course.

The students' own preparations appear to have bene a significant actant. The colloquium sessions put a heavy load of responsibility on the students, and failing to do the preparations was typically experienced as "letting one's fellow students down." This is an example of an implicit norm in the academic community of history that was made explicit by setting students in situations that shed light on the possible implications of such norms.

Assessment and feedback. The students' work was evaluated halfway through the term according to the same criteria as the final thesis. This mid-term evaluation was used by the lecturers to increase the students' awareness of what was deemed good academic history writing and could, in that sense, be considered an actant that participated in solidifying the network formed by the lecturers, the students, and the academic history genre.

Also, the students were encouraged to present chapter drafts from their thesis to their co-students and supervisors as a way to improve the final product. Examples from draft chapters written by students were used as pedagogical actants to illustrate how the norms and rules of the field may have been broken and to stimulate discussion as to how the original text needed to be rectified to follow them.

The students were enjoined to provide constructive feedback to each other's drafts and take great care to not hurt anyone's feelings:

> I use the student colloquia to both train them [the students] to understand critic, and to give critical feedback in a way that is friendly and constructive. The point is to build a good learning environment, where one gives reading suggestions to each other, recommend sources, look at each other's way to write, so one gets training in how to formulate [constructive criticisms]. (Extract from an interview with a lecturer in the History master's program)

The data suggests that the students took this activity seriously, expressing it in terms of a "code to be cracked." It appears from the data that they consider this activity as useful, not only for the recipients of the feedback, but also for the providers, as it allowed them to develop a skill that they foresaw would be valuable in their future activities be it as researchers, as school teachers, or as office workers.

Master's Program in Mathematics

Teaching methods and pedagogical perspectives. For all the teachers interviewed in the Mathematics program, teaching consisted of conveying the material in a personal manner (e.g., providing extra details, substance, and life while using ideas, pictures, stories, and other devices for remembering). The teachers generally considered those pedagogical techniques key elements in stimulating students' understanding of the material they were meant to go through. However, one interviewee expressed that there was a fine balance between providing too many explanations during a lecture and giving too few:

> It is like a melody played by the pianist. It functions best without disruptions or metacomments. [If you] interrupt the pianist to tell the audience: "listen to this her, isn't it a great way of interpreting [that part of the piece]?" And then "You can now continue playing." Then, the melody is gone. . . . Sometimes I feel a bit too pedagogically-oriented, at least when I had planned to give a pedagogically sound explanation, and it does not go well. . . . It should have been a small hint and it grows to be a giant elephant and you think: "no, that didn't work." (Extract from an interview with a lecturer in the Mathematics master's program)

In the light of our theoretical framework we can conceptualize all the different parts of such a lecture as a complex network of actants: chalk and chalkboard, symbols, ways of thinking and acting, etc. Those actants were tightly interwoven within a package that was presented to the students as a given, thereby contributing to making its contribution to student learning implicit.

It appears from the interviews that the students were mostly indifferent to the teaching method. However, they noted that they enjoyed concrete examples and humor in a teaching situation. They were also appreciative of lecturers who were genuinely interested in the material and who managed to present it in a structured way. The interviewed teachers in the Mathematics Department enrolled the chalkboard and the chalk in the process of conveying the right information at the right pace: "First of all, I write the same speed as they write. Second, it gives a lot of flexibility to add things."

Demonstrations, assignments to be solved, and right answers to be found. According to our dataset, teaching mathematics primarily consisted of three parts: lecturing, solving assignments, and going through assignments afterwards. The lecturing was done exclusively by the teacher and assignment solving was done by the students between classes, mostly individually, although some choose to form a colloquium group to learn from one another. Going through assignments was done during classes, either by one of the students who has come to a solution or by a teacher. We observed in several instances that the students both before and after the class used the classroom to go through assignments with each other. In all those instances, one student was standing at the board and writing his or her solution proposal, and the others were sitting at their desks watching or taking notes. This way of organizing the teaching activities conjures up images of a tightly knit network of actants, whereby the existence of each actant is highly dependent on other actants, or in other words, a blackboxed network of actants. The process of unpacking the network and identifying the different parts of it was up to the students.

Master's thesis and other semiotic actants. One lecturer talked about mathematics as a craft, and it can be suggested that the lecturer-student relationship bore some resemblance to a master's-apprentice relation, where the tricks of the trade were learned by observing and reproducing practice. Lecturer 3 commented that the students saw "a mathematician at work," in particular when it came to mastering justification and proof that were described as the pillars of mathematic argumentation.

The students seemed to believe that the process of going through various assignments was an important part of learning mathematics. Both the demonstrations provided by the lecturers in the class and the process of trial and error when solving assignments contribute to building a certain automatism, the acquisition of a certain mode of thinking that will allow them to become better mathematicians. Just looking at a lecturer solving a problem would not be enough to understand how to solve it individually (e.g., "you don't learn how to play football by looking at football matches").

All the interviewed lecturers referred to syllabus books as central study tools in their teaching. One lecturer mentioned that she first chooses a book that she sees as relevant for the course and then uses it to structure her teaching plan for the rest of the semester. In addition, all the observed students took careful notes of everything that was written on the board. They used those notes to prepare themselves for the next class and as some sort of personal syllabus book. Students who were not able to attend a class could only get hold of the entirety of the material covered in the class by borrowing other students' notes. It can be suggested that the lecture notes taken by the students were an important actant in the processes of learning and preparing for examinations.

As far as the master's thesis is concerned, both the end result and the writing process were significant

actants in the teaching and learning practices. Several interviewees emphasized the importance of starting early with the writing process. This is connected to the idea that the academic genres pertaining to the discipline of mathematics need to be learned through writing, as mentioned by one of the lecturers: "The minute they start writing, they start asking questions that are of great importance. Questions that it is easy to ignore if you don't write." It is also evident that the master's thesis played a central role in the education of a mathematician, as students were encouraged to start thinking about it during their bachelor's degree work.

Architectural and other physical actors. All of our classroom observations point towards the idea that the amount of chalkboard space was of much importance both for lecturers and students. One of the lecturers mentions explicitly that she always started writing on the chalkboard at the front of the room because it would be hard for the students sitting at the front to write down everything if they constantly had to turn their heads around.

Discussion

The section above has presented various elements related to ideas of quality teaching and learning as they appeared in different discipline-related or "tribal" discourses, to use Becher and Trowler's (2001) terminology. The patterns of how elements are constructed, how they relate to each other, and how those relations can be conceptualized as networks were significantly different in each of the three programs. As the disciplinary discourses differed significantly from one program to another, it can be assumed that the concept of quality in teaching and learning also varied along with these patterns. Disciplinary discourses are strongly affected by the related academic tribes, and the way these cultures recognize and support certain behaviors and values over others strongly enhance student learning trajectories. Table 1 summarizes the main actants that could be identified as emerging from the data set in the previous section.

Table 1
Overview of the Main Actants Emerging from the Data

	Master's program in educational leadership	Master's program in history	Master's program in mathematics
Approaches to teaching	• A sociocultural approach to learning among faculty members • Teaching, supervision and assessment activities based on a participative approach to learning	• A traditional learning environment and academic freedom • Assessment and feedback related to academic genres, involving student participation • A nexus of contexts and interdisciplinarity	• Traditional approaches to teaching using chalkboard and chalk
Key activities	• Large and varied amount of learning activities	• Writing drafts and presenting them to peers and teachers • Providing feedback on drafts	• Justification and proof • Studying examples • Demonstrations, assignments to be solved and right answers to be found
Methodology and epistemology	• Strong methodological and epistemological focus among lecturers	• Significant focus on methodology and epistemology	• Tacit agreement on methodology and epistemology
Architectural and other physical actants	• Varied premises to cater for the variation in teaching methods	• Lack of flexibility in terms of classroom type and size	• Classroom centered around the chalkboard
Semiotic actants	• Master's thesis	• Master's thesis • Unusual artifacts	• Master's thesis • Syllabus books • Individual notebooks

The Master's Thesis as a Pillar in All Three Programs

One of the main common points from the data was a strong focus on the master's thesis both among the academic staff and among the student body. It appears that the master's thesis was a major structuring element in the design of the courses. In addition, all the interviewed students conferred much prominence to activities related to enhancing the final product that the thesis constituted, reflecting the fact that the thesis grade weighed much in the final grade of all three master's programs. However, the level of "thesis-centeredness" varied between the three programs. Both in the mathematics and history programs, the feedback activities were centered on the master's thesis. In contrast, the Master's in Educational Leadership program was built upon a large number of learning activities, many of which did not touch the master's thesis directly.

Data gathered from interviews with the lecturers in the educational leadership program suggest that much of the teaching and learning activities in the master's program aimed to provide the students with the various skills required for structuring, writing, and completing their theses. The lecturers seemed to consider a continual development of the program, including syllabus and teaching methods, as an important element in the quality of teaching. They also strove to make the program as relevant as possible to the professions that could be classified as pertaining to educational leadership. It can therefore be suggested that relevance and up-to-dateness were core mediating actants in this program.

Writing as a Mode of Thinking

Data from the Master's in History program points towards the value of the writing process as a way to acquire the necessary skills of a historian, with a particular focus on the master's thesis. In particular, historical methodology seemed to be of crucial importance in the culture of the master's program, both for lecturers and students. Several of the interviewed students expressed that they saw their discipline as requiring a distinctive mode of thinking. The data indicate that activities such as publishing in a student journal or conference presentations were an integral part of the student experience during the program. In that sense, we can say that the history students were given the opportunity to step into an academic culture at an early stage.

It can be suggested that history as a discipline forms a stable network where a large number of actants are implicit. For example, understanding and using historical methodology properly is generally a prerequisite to being considered a proper historian, but there is little explicit discourse about what such methodology is. However, in a teaching situation, examples are used to illustrate what is methodologically sound or unsound, thereby explicating to some extent the concept of historical methodology. It can be hypothesized that once the students have transformed and internalized those mediating actants, they can get closer to being an integral part of the network of the discipline. This example illustrates how mediating actants are not either implicit or explicit per se, but they move from one status to another throughout the students' learning trajectories.

Both the students and the lecturers in the Master's in Mathematics program considered the specific mode of thinking that pervades mathematical work to be essential. Textbooks played a central role in the master's program. For the lecturers, finding a good syllabus book was of primary importance, and the students also referred to the syllabus book as invaluable. However, all the students we observed copied by hand the lecturer's notes on the board in their entirety, and, in addition, they wrote down those lecturer's comments that they believed could be useful for the specific problems addressed in their theses. Being able to derive the right answer and the appropriate route to the answer for a number of given assignments constitutes a fundamental skill for mathematics students, also at a master's level.

An interesting finding from the program in mathematics data is that the students were encouraged to think about their master's thesis while they were working on their undergraduate degrees. That students in Mathematics were treated as future researchers at an early stage underlines an implicit norm. Student learning is to a high degree implicitly mediated on this point. The teaching method used throughout the course is implicitly embraced, as it is the norm in mathematical research practice. In that sense, a number of mediating actants are central to the teaching in mathematics, ranging from physical artifacts such as chalk and chalkboard to more symbolic ones such as the "mathematical mode of thinking."

Learning Environment

In all the master's programs studied, motivating the students and making them feel safe seems to be a significant element in the quality of the program. The three programs seem to have used different strategies to achieve this goal. The lecturers in the Master's in Educational Leadership program seemed to consider the design of a variety of learning forms as vital when trying to create a quality learning environment. In the Master's in History and the Master's in Mathematics programs, the design of the course seems to be less

crucial, since the learning forms that are used are presented as traditional within the discipline. In that sense, it can be suggested that the teaching methods used in the Master's in Educational Leadership program were explicit mediators of the student learning, while the teaching methods in history and mathematics were to a much greater extent implicit mediators.

The architectural environment of the University had different implications on the feeling of quality among lecturers. We can hypothesize that those differences have their roots in different evolution in teaching styles in the three cultures. The University buildings used for the programs we studied were all built in the 1950s, with large amphitheaters and medium-sized seminar rooms being the predominant style. For the teaching in mathematics, the architecture seems to have worked optimally, with large amounts of wall space covered with chalkboards. Among the lecturers in history, there was some discontent about the lack of flexibility in the way the rooms can be used. In the Master's in Educational Leadership program, the architecture seems to have been a significant hurdle to the performance of some of the activities, in particular small-group activities, and is therefore an example of an actant whose mediating role may either strengthen (e.g., in mathematics) or weaken the learning network (e.g., in educational leadership).

Teaching Process and Teaching Style

The teaching process seems to be more a collective endeavor in the Master's of Educational Leadership program than in the other two master's programs. It is remarkable that the lecturers at this program mostly used the plural form of personal pronouns and possessive adjectives (e.g., "we," "us," "our") when referring to the teaching work they participated in, while the other lecturers mostly answered using the singular form (e.g., "I," "my," "mine") when describing their teaching work, with little reference to a collective teaching strategy.

In the master's program in educational leadership we identified tensions between a traditional lecturing style and attempts to implement sociocultural learning. As the program was delivered as a part-time course and the students often have a full day's work behind them when they come to class, they seem to have been more inclined to want to sit back and listen to lectures rather than participate in activities of a sociocultural kind. In other words, the students were not particularly eager to embrace sociocultural learning forms and seem to have favored more traditional lecturing forms. In that sense, we can say that the network formed by the lecturers, the students, and the traditional lecture form was rather strong while the network formed by the lecturers, the students, and alternative student-active teaching forms was much looser: "I think that I, or I feel that I have a tendency to tell them to much and give to little space to them."

Our data suggest that implicit mediation was more predominant in the mathematics and history programs than the educational leadership program. In particular, the norms related to what mathematicians do and what historians do was central to the socialization of students within the field. In contrast, the educational leadership program did not seem to be built around such implicit norms. Instead, the lecturers emphasized explicit norms such as the thesis line and consciously used various artifacts to facilitate the students' acquisition of the required skills.

Student Learning

The data show that both explicit and implicit mediation were present in all the programs, but they took different forms. At the Faculty of Education, there was a wealth of tools that pertained to explicit mediation. For example, the thesis line illustrates how anxious the lecturers were to providing unambiguous devices to support the students' work with structuring their thesis. The students interviewed agreed that the thesis line had some utility when it came to going through the various elements in the thesis, but it emerged from the interviews that the thesis line was also experienced as constraining. The main constraints appear to have been that it could limit creativity and hinder an open-ended exploration of the field. Because the thesis line was introduced by the lecturers as a key tool in the writing of thesis, the students related to it as an obligatory point of passage. Although the lecturers had a very clear idea of how the thesis line was meant to facilitate writing, the students did not necessarily understand the link between the thesis line and the thesis. Data from the study suggest that the lecturers blackboxed the thesis line and followed it without much thought about its facilitator role.

Transformation

The Vygotskian notion of transformation from spontaneous to scientific concepts has much relevance in understanding how students structure and restructure knowledge (Vygotsky, 1978). The instruction given by the lecturers played a significant role in shaping learning processes, as it introduced scientific concepts that became powerful forces in directing the students' processes of learning. For example, it emerged from the data that one of the main transformations within the master's program in history occured in organized activities whereby students went and accessed various types of historically relevant sources. Those may have been archived texts and documents, but they could also

consist of esthetical artifacts such as a theater play, a piece of music, a building, etc. The aim of those activities seems to have been primarily to provide insights into issues that have more or less direct relevance for the students' master's theses and can therefore be conceptualized as important actants with an explicit mediating function.

However, the data suggest that the acquisition of a specific historical methodology happened mostly via implicit mediation. In our dataset, neither the lecturers nor the students refered to any explicit guideline as to what was expected in terms of historical methodology. This skill seems to have been acquired via feedback from lecturers and from co-students. The feedback was given both on the students' actual master's thesis texts and on illustrative examples gathered by the lecturers from earlier student theses. Epistemology also seems to have been central to the program, but it was not always introduced explicitly into the learning process and may therefore belong to types of actants that are partly implicit mediators.

As the mid-term evaluation and the various feedback exercises were introduced consciously by the lecturers for the purpose of increasing the quality of the final thesis, they can be labeled as explicit mediation actants. Both lecturers and students emphasized the importance of using down-to-earth examples to illustrate complex ideas. The use of examples in teaching situations seems to pertain to both explicit and implicit mediation. Illustrative examples were introduced intentionally in the teaching to make it livelier. However, what those examples were meant to illustrate was their appropriateness within a historical discourse, which was not clearly defined. This discourse was based on epistemological and ontological norms specific to the field of history but that were rarely spelled out and can therefore be called implicit.

Another implicitly mediated norm is that the history students were considered to be researchers in their own right. They were given much freedom in their choice of topic and were encouraged to use publication and presentation channels similar or identical to those used by paid researchers to present their work. One of the students interviewed expressed that history assignments began to be "fun" at the end of the bachelor's program when the students were allowed to choose their topics more freely. We choose to interpret this as implicit mediation, where the students embraced norms that were a given within the field.

It seems that two main transformations occurred in the master's program in educational leadership. The first one was a transformation "from description to research." Many of the assignments that were given to the students took the students' practice as a starting point and aimed to get them to analyze and reflect on it so as to achieve a more academic understanding of the field. The second transformation was in the conversion of the knowledge provided by the lecturers into practical skills relevant for the students' practice.

We observed that the lecturers were generally little involved in the transformation activities of the students, as those tended to happen primarily when the students discussed and worked with each other within the realm of their study groups. It is to be noted that the lecturers were proactive in orchestrating discussion; for example, by designing the assignments that were to be discussed and carried out as a group and by allowing for plenary discussions during the monthly seminars at the University. We have observed that the students often brought their own practice-based experiences to the plenary discussions.

In the faculty of mathematics, a number of elements were made explicit by the lecturers. For example, the lecturers provided an overview of the various topics that were going to be covered in the lectures at the beginning of the course. They also provided detailed information about the books that dealt with those topics and which parts (e.g., chapters or pages) were relevant to which topic. The demonstrations of the theorems and proofs were also provided explicitly by the lecturers during the classes.

There were also several implicit aspects to the mediation in the teaching and learning activities we have observed in the mathematics program. For example, we observed that the teaching was done through writing demonstrations on a chalkboard, while the students copied the demonstration onto their notebooks. The notes were central to the preparations for the next class. We also observed that the students used the classrooms to help each other understand the material, using exactly the same presentation method as used in the classes (i.e., one of the students wrote on the chalkboard and the others took notes). We suggest that this practice can be conceptualized as embedded in the culture of mathematics learning. In that sense, the use of chalkboard and chalk to convey information may be seen as an implicit mediation in the teaching of mathematics.

It seems that, in the faculty of history, the lecturers thought of teaching as an individual activity. We see in the data few examples of common teaching strategies. One exception is the idea of a colloquium group, which was pioneered by Lecturer 2 and copied by two other colleagues. However, even in this case, there is no indication that those three lecturers developed a common strategy around this teaching form. Rather, it looks like an individual form of teaching was copied by other individual lecturers. In that sense, we can suggest that the network formed by the lecturers of the department was not tied very closely around a common set of teaching methods.

Conclusion

In this article, we argue for distinguishing between explicit and implicit mediation in order to understand how meanings are shaped and negotiated through the various processes of learning. As outlined by Vygotsky (1978), the relationship between signs (e.g., a theoretical model) and student thought does not remain constant. Signs first appear in social and individual action without their users being fully aware of their meaning or functional role. It emerged from our data that being a master's student was a process of coming to understand the meaning and functional significance of the signs that one was using all along.

The concept of mediation points to the fact that student activities such as discussing and writing master's assignments involved employing a sign system that was not always spelled out. "We say more in the sense that our interlocutors may understand us to be conveying a higher level message than our mastery of the sign system would warrant" (Wertsch, 2007, p. 187). The situation in many instructional settings involves students saying and doing things they only partially understand. The meditational means allow students to function at a level that is "out ahead" of their current mastery.

In mathematics and history, the mediation is more implicit (Wertsch, 2007), while in educational leadership it is more explicit. In ANT terms, one can say that the students in mathematics and history were invited into the established network of academic research, and they were being formed into a certain established way of thinking, reasoning, and acting. Conversely, in the educational leadership program, the lecturers worked more specifically towards building a learning arena designed primarily to enhance the students' learning. The lecturers' goals seem to have been principally to meet the students "where they were," using their own practical experience and theoretical understanding to help them develop their own understanding of the field. It is perhaps not surprising that mathematics and history seem to have a more established academic identity than educational leadership, since those two first disciplines have millennium-long histories, while the field of school development and educational leadership is relatively young as an academic discipline.

The goal of a higher education study program can be defined as students mastering the mediating actants that belong to the discipline or the profession. Acquiring expertise entails entering an existing social order within which knowledge about the appropriate use of tools is passed on through processes of mediation. These processes belong to the core of quality teaching and learning as constructed within discourses and practices. Students unpack the concept of teaching and learning quality within a program leaning on one or more disciplines and, most importantly, on the history and culture of those disciplines. We regard academic discourses and practices as contextualized, social and historical, which implies that ideas of quality teaching and learning are intertwined with activities, norms, rituals, and symbolisms that have strong disciplinary roots.

The results of our study point toward an intricate web of mediating actants, some of which allow for implicit mediation, while others enable explicit mediation. Such actants provide students with the opportunity to take the tools central to the discipline into use and gradually find their full meaning as they apply them. In both types of mediating processes, the individual and social levels are in constant symbiosis. Mediating actants and the networks they form act as crucial forces within the academic tribes and thus in student trajectories of learning. The transformation of key mediating actants from implicit to explicit (and back to implicit) is central to bringing in individuals into the social network of the discipline—and to making the social network of the discipline an inherent part of the individual's learning trajectories.

To understand how students unpack such norms and the clusters they belong to, we have suggested an analytical approach that enables investigations of both individual actants and networks of actants. We have identified these as important elements in constituting specific disciplinary discourses and practices, and we have shown how this appears concretely in three specific master's programs. Teaching and students' learning trajectories are mediated by historically and situated developed actants, and networks of actants support student learning implicitly and explicitly. We believe that this approach to quality of teaching and learning can be fruitful both for the purpose of understanding how quality teaching and learning appears within specific academic tribes and as key information for the purpose of developing study programs further.

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