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The anthropology of didactics and learning

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Definitions of didactics (and teaching) are sometimes made on the basis of references outside and above the immediate classroom processes. The didactic questions are phrased in terms of what, How and Why (A.a, 1987; Selander, 2010:202). The curriculum, policies and the various subjects, are the point of departure, when these questions are answered and problematized. At the same time, there is the school's reality in the classrooms, but more as a recipient of this problematization. This reality can be the starting point of an inside reflection emanating from teachers and students and their actual situation. This is approaching Arfwedson (1987) in terms of his "the field of implementation" and the discussion below. How do we get a different perspective on What, How and Why based on teachers' practice? Are these questions at all realistic to ask (in practice) and what answers can you expect? What content has for example teaching science from a student's perspective? And how is the issue understood from the teacher's perspective at the practical level?

When we listen to the early German discussion of didactics (Blankertz, 1987), I see that my interest is similar to the perspective called the learning theory model (and to some extent the cultural model) which mean that one should take into account the many factors that affect the teaching process. The reasoning is influenced by a learning psychological perspective, control structures and marked by the spirit of the times. In the debate held in this text, I am more restricted to the internal factors in the field of implementation and Blankertz (1987:35) observation that the didactic problems are complex. Here the term "didactic intuition" becomes in focus (Kroksmark, 1997) in thinking about teachers' work and what I perceived as intelligent improvisations (Hultman, 2001).

Didactics

The concept of didactics is given a broad definition and is based on the debate on didactics as discussed by Bengtsson (1997), Dahlgren (1990) and Säfström & Swedner (2000). The concept didactics is derived to Ratke (Blankertz, 1987) in 1612 that presented a normative didactics with instructions for content and techniques, then Comenius (1999) who saw it as a theory of the art of teaching. Then Herbart with a normative approach where education was seen as a part of caring/education. He saw the psychology as a guideline for the selection of methods, but also considered that there were limits to the use of scientific knowledge. I would like to refer to Kroksmarks (1997) study of the concept of "didactics" and its ambiguity in different countries and cultures where he gives the following definition of didactics, "... the term didactic(s) for 'the art and science of teaching'" (p. 3).

Lundgren (1986 in Bengtsson, 1997) says that: "didactic research is such research whose interest is to understand and explain how teaching entails and how it affects the individual's learning, thinking, memory and oblivion, that is to say, the relationship between teaching and learning".

Didactic research therefore involves learning according to some researchers. But one can discuss various forms of didactics. A normative where such as interested in rules for how teaching should be implemented is in focus, a descriptive which conducts empirical studies of actual teaching, a metaform with a philosophical orientation that reflects on the basics for the previously mentioned. Added to this is a theoretical-critical didactic that can both be scientific and

focus on practical theories and self-reflection of teachers. It should also be noted that didactics is something practical, the art of teaching. Practical didactics can both refer to a skill acquired through training or as a result of natural talent.

The practical forms of didactics can be the subject of scientific research. One may therefore be interested in the normative side of the methodology, but you may also be interested in researching practice, the choice of methods and elucidate how teachers work and learn.

One can perceive the different interests and specializations of didactics both in general- and subject didactics. The subject didactic interest can apply to Swedish, literature, history, mathematics and science. Added to this is the general didactic interests in the form of research on teachers ' work and classroom interaction. This also includes the area of knowledge creation and learning that emphasizes actors ' work and learning in the classroom.

In the latter case, interest can be focusing on the interaction in a triad: between L (teacher) - E (students) - S (subject), in the classroom, and research can take an unprejudiced approach, and with the help of actors (teachers, students) and the theories seek a deeper understanding. Participants ' picture of what is happening and the way they think about and interpret what is happening, becomes important. This means, maybe, that we can add a dimension to the debate on "didactics" as it is portrayed in the practical execution?

According to some definitions of didactics you can equate the term with teaching doctrine, often with a normative meaning. From a more situated perspective, practice will be in focus and you play more attention to teaching and learning, as it actually looks like in practice. And then you would be able to give the classic questions, above, a different meaning according to the following:

HOW - how is teaching, de-facto performed? What strategies are used by teachers'?

WHAT – what are students learning? What content is taught?

WHY – how is the teaching process justified?

One can approach the questions relative the triad, with particular interest in the subject or relations or, with my interest, the relationship between teacher and student in context, be it dominating?

Didactics is not something that teachers are working with or as (only) is taught in teacher training, but it becomes a way to perceive what is happening in the classroom. It should be interesting to use didactics with this meaning and this text examines the idea? The researchers ' task would be to take their starting point in teachers and students to understand how they think, reason and act in-situ. And this has previously been highlighted in areas such as frame-factor

theory (Lundgren, 1984), but an additional contribution would be to bring in the actors' view to be able to understand how the system is made to work.

Our interest focuses on the triad, in context. Others may be interested in the subject structure without seeing a link to what happens in class. Still others might be interested in teaching and how students learn science i.e. the interaction.

Didactic triads as metaphors for the teaching pattern

Sometimes the images and metaphors can be a great way to illustrate processes in the classroom, or how you perceive teaching (normative or empirical). I have previously used metaphors, in the form of didactic triads, shown in figure 1 below, on various occasions, e.g. in connection with research in mathematics education (Hultman et al, 1976). And recently, Oerback (2008) used the didactic triangle in a discussion of didactics. I would like to illustrate my interest, in this text, using different metaphors for instruction, figure 2, in which we start from the basic pattern in Figure 1. I work with four types of approaches to the teaching and learning environment. These models/metaphors related to the current discussion on the different learning theories but without accurately depict these: teacher as leader, constructivism, situated learning and apprentices-in-context.

In Figure 1 (theory A, B and C) the different possible relationships and interactions that can be of use when one creates the various metaphors. In theory A we illustrate a situation where the interaction is weak or missing, in B the interaction between the teacher and student's strong and

in C the teacher and the topic dominates. We believe that even theory A could be of use to highlight the aspects of teaching where the classroom is characterized by deficiencies in the interaction.

Learning theories - triads

Figure 1: the didactic triad in context. Figures showing (micro graphs) theory (A) to (C) that illustrates how triad can be used to discuss relations with both strong, weak and loose connections. These opportunities are used in Figure 2.

Figure 2 illustrates the different didactic models and metaphors and in model 4 the student's situation is in focus and the learning environment that surrounds him/her. But we can, of course, in a similar way, illustrate the teacher's situation but with a different appearance. All of the above metaphors can be used in most situations.

My interest, in this article, is primarily focused on the fourth model/metaphor because research found that this metaphor highlights aspects not discussed so clearly before (see below). When we analyse the interaction between teachers and students (Löfgren, Schoultz, Hultman and Björklund, 2011) we see how different approaches and patterns (metaphors) is illustrated in various teaching sequences and we have developed a Codebook to capture what happens in classrooms. Our data is based on video recordings, stimulated recall interviews, transcripts and contextual interviews (Hultman, 2001) with teachers and students.

Oerback (2008) argues that we should play attention to the difference that may arise between didactic metaphors (she uses the term theory) and actual teaching. In this text I would like the various metaphors to reflect the characteristics of different teaching situations. Research can then use empirical evidence to pronounce different situations and didactics. Oerback argues that the difference between subject didactics and general didactics is that the former implies that it is the teacher who select content or that it has been chosen for the teacher. In the general didactics case, a more general interest is created in the skills that are important in most situations. She brings forward the importance of considering students 'professionals' (compare Libergs 2010 position below) and co-creator of the subject content that is realized. She argues that the teacher must accept and work with the student's comprehension of the content, otherwise the desired encounter will not be created, (figure 1 above) between teacher and student. She believes that there is a risk in using the concept of didactics as it is strongly tied to the teacher. And then one miss the notion of the learner as an active participant in the creation of subject and subject didactics. This is similar to the difference between the metaphor 1 and 4 in figure 2

above. She sees this as an opportunity to find a bridge between didactics and subject didactics. She wonders where the discipline and the subject exist? And respond to it varies, it exists in the dynamics in the classroom, in the teacher's statements, in textbooks, in the selection of the books and in the tools and methods used in the analysis. The subject becomes part of the context, and is created in the communication and the interaction.

Here, we would also refer to Carlgren & Marton (2001) and their discussion on the professional object. And a similar discussion by Lampert (2001) with her model of "Teaching Practice" which draws attention to the teacher and the students as actors in a complex educational learning environment, the didactic triangle.

Teachers ' work and learning/didactics

In a review, by Grimmett & MacKinnon (1992), particular attention is on teachers' professional skills and its relationship to teacher training. The authors tone down the idea of teaching ("discipline of teaching") as an academic subject, focusing more on teaching as art or craftsmanship. A central question becomes: *How do teachers orchestrate the experiences of learning so that students find the engagement, attractive and stimulating?*

They are interested in "the craft of teaching" and the alternate form of knowledge it is about. They see two specializations; from applied science to practice development. The first assumes that the research control practice; that research affects educational design; that teaching is taught and that this is applied during training periods in schools. The second assumes that it is knowledge that is generated within the teacher by reflection over time that will influence research. Research is based on the current practice and creates, through the analysis of it, understandings that can be reformulated to either transmitted knowledge or form a basis for reflection.

In such a context we talk about craftsmanship, "craft knowledge", as the teacher's attempts to understand the everyday mysticism. The teacher does this from their own perspective as "the apprentices in context" (Hultman, 2008). In such a situation an informal network is created which provides a basis for a knowledge base. This is contextual knowledge and the informal dimension has priority. The traditional view of "craft" is that knowledge is transmitted or occur through "transmission" but Grimmett & MacKinnon use the term "situated knowledge" as an alternative. This is in line with the recent research and theory on situated and sociocultural perspectives (figure 2, model 4). It also connects to the Swedish debate about teachers' professional object that focus on learning processes and the understanding of that dimension (Carlgren & Marton, 2001).

In an attempt to understand "craft knowledge" Grimmett & MacKinnon discuss intuition, empathy etc and that it is all about "knowing" (instead of telling). They advance concepts like rolling planning, work as passion and presents a criticism of teachers' professionalization. In a discussion on "the art of teaching to become a teacher", they argue that teachers learn to create the situation themselves. And they point to the informal side of life in schools.

Grimmett & MacKinnon concludes their overview with some reflections on how craft knowledge can be used. One idea is to try and see and observe classroom work anthropologically, which among other things means that the traditional concept of class being dissolved. Taking the example of the teacher training and argues that the candidate, the teacher and teacher trainer teaches and reflects together, side-by-side or "at one other's elbow". We learn how to teach by doing and getting experiences. Science (books) is pitted against feelings (at the elbow).

They conclude with a thought that their research review is actually an oxymoron, you cannot learn "craft knowledge" in books!

The position of Grimmett & MacKinnon is to equate teachers practical and methodological knowledge with craftsmanship. They show that knowledge creation is something that can be considered contextually and situated.

Didactics, what happens in the classroom

The research on the learning process in schools and similar organizations that are relevant to the teacher's development are few in number. Huberman (1983) points to the complexity of teachers' work (see also Jackson, 1990) and Eraut (2002) points out that we lack adequate analyses of the complexity in teachers' work and that teachers' knowledge creation differs from other professions because they create their knowledge through a number of episodes from a busy and overcrowded environment. Ainley and Luntley (2007) points out that an experienced teachers have the opportunity to act in a more efficient manner. The ability to see and interpret and evaluate classroom situations was crucial for the quality of teaching. The experienced teacher who seems to "see" better, to evaluate better and functions completely automatically has attracted the attention of many researchers (Berliner, 1994; Jack & Kroksmark, 2004; Kroksmark, 1997; Krull, Oras & Sisask, 2007). The development of these abilities, from novice to expert, takes many years and requires experience and dedication (Dreyfus & dreyfus 1986; for a critical reflection see Bengtsson, 2010). Current data within psychology and neurophysiology explains the difference between the expert and the novis way to see and assess via the explicit (conscious thinking) and the implicit (unconscious recognition) system that is used both to understand and judge the world and to learn to recognize situations and attributable events on an automatic, intuitive and uncontrolled way (Björklund, 2008).

We have in the earlier classroom studies found that the teacher puts a lot of effort to create good relationships in the classroom (Wedin, 2010) and context for teaching. He/she care about the students and trying to create safe environments (Berg, Löfgren & Eriksson, 2007). Questions is forming: what is it that controls the actions of the teacher in classroom practice, how much is "tacit knowledge" and experience of students, the subject and the classroom? According to Hultman, the teacher can be considered as an actor that creates meaning in context. She/he spends most of his working time with the students and the teacher's learning can be seen as a form of apprenticeship, apprentice-in-context (Hultman, 2008, cf. Lave, 1993). Teachers need calm and insightful conversations with the student but are forced frequently to prompt immediate action (Eraut, 2002). An interesting question then becomes how teachers can learn in such an environment and what kind of didactic considerations they make in such situations (cf. Weick, 1985).

In a previous study, we have followed the students in primary schools participating in the so-called STC (NTA) project. The focus has been on science teaching, carried out within the framework of this project, as a natural experiment, and we've studied and analysed what happens in classrooms. The results of these studies show the need for the active involvement of both teachers and students. The teacher helps the student and give him/her the opportunity to learn and understand science and then not only factual knowledge but also process knowledge and ways to see, discover and describe events. There is a need for a teacher who is active, knowledgeable and caring and who leads the student to new knowledge. The outcome of the work in the classroom depends on the combination of students, teachers and materials. The classroom situation, frames and the teacher's own interpretation of the didactic situation, means however, that the performance in the classroom looks different than what was planned. Often there will be a lot

of "doing" and less of reflection and this leads to empirical knowledge, and that pupils do not learn to draw general conclusions. The student may not be able to develop tools such as "viewing" into a more scientific observation. An important part of the teacher's work seems to be to establish context for students that provides motivation and desire to learn.

Didactic as situated practice or the anthropological of didactics

The didactic questions were originally and are still produced and anchored outside the classroom, and they may not be able to be answered in the same way when we change level. But I think it makes sense to try to discuss didactics from a classroom perspective. And with a particular interest in the dynamic of classroom interaction. In this way, it should be possible to reflect on how content (What) is transferred and adapted to what is happening in class. The teacher's interpretation of curriculum, lesson planning and teaching material undergoes a transformation in the transition between the teacher's planning and the actual outcome for a given lesson. And how this is realized in the individual students are an important research issue.

Selander (2010:212) points to this aspect when he states that: "the understanding of the didactic aspects are developed with the concrete works in a practice which has responsibility for other people's learning". And it is this aspect I would like to draw attention to. He also takes up didactic design which means that the teacher, today, have a greater responsibility to interpret such as curriculum, i.e. a responsibility to design education. Selander points out that this also applies to the pupil. My interest is how this looks in-situ, which i discuss in this text. As Selander, my interest focuses on a better understanding of learning and learning environments and Kroksmark's (1997) term, didactic intuition.

But also a better understanding of the discussion in Liberg (2010:221) about the student's agency that is, students are also (as the teacher) conscious actors who make their choices, e.g. as regards content. That is to say, they're also didactic actors. In a study of Nuthall (2005) his results shows that students at the same time are included in three interacting contexts: the official teacher-led; the partly hidden peer relationships and the personal and private dimension (attitude, family, home environment). He argues that much of the research is based on a lack of understanding of students' lives in the classroom (see also Eraut, 2002). The teacher do not "hear" individual students, is one of the insights, but are directed to that which is visible, which is reminiscent of the phenomenon of "small talk" as noted in a study of the science classroom (Schoultz, Hultman & Lindkvist, 2005).

In a study of Timperley & Alton-Lee (2008) similar findings are reported:

At the heart of the problem teachers face in the classroom is knowing what is going on in the mind of the student's ... This poses a problem for teachers and researchers because what is going on in a child's mind is essentially unobservable, and many of the clues teachers take to be a signal of what is occurring in students' minds are unreliable or misleading. (p. 338).

[a teacher] ... I would have liked to thought that I was tuned in to what was happening in the class ... I just didn't know ... (p. 338)

This may seem a little excessive because we also know that experienced teachers acquire different strategies to increase their knowledge of the invisible dimension of the work together with students. Examples of such strategies is micro dialogues, "eye-in-the-neck" and listen to the students' talk and their impressions from the classroom environment. But as Kroksmark (1997) noted, a great deal are invisible and intangible but even so there is a learning taking place and sometimes even an unconscious knowledge creation in action that I sought to capture in the metaphor intelligent improvisation (Hultman, 2001).

It connects to Liberg's (2010:231) argument, that the teacher could be understood as an ethnographer, which would mean that he/she in parallel with their work, study their own and others'

teaching. We have developed this both empirically and methodically in some of our research (Hultman, 2001, 2008; Schoultz, Hultman, Lindkvist, 2005) where we connect to the early ethnomethodology and Garfinkel's work (Garfinkel, 1967). This approach encourages reflections on the methods people use to create meaning in the everyday, what they do to create meaning and for managing a complex environment and that this creation and action is part of a knowledge creation process.

To get an idea of this, studies with this approach, can be done. But already reported data can shed light on a local didactic that I perceive to be situated and the term "anthropology of didactics" a definition that is based on what is happening in practice. We get to know this by field-sensitive methods such as participant observation and video recordings as well as approaches derived from anthropology and ethnomethodology.

Some classroom research and some research on teachers' work should be used. Observational studies and conversational interviews (Hultman, 2001) can give us valuable impressions and experiences that can contribute to the descriptions and interpretations of the everyday interactions. Why is teaching developing as it does? We know that many factors influence this, such as frames and actors' behaviour (framework factor theory, Lundgren, 1984). It is in the classroom dynamics that the didactic questions is answered, without we being able see some of the answers, because it becomes woven into the ongoing activities. There is no written document that can be evaluated and looked upon, because planning documents are relating to an intended and desirable outcomes. The definition and discussion of didactics should be based on the local situation and what actually takes place in classrooms.

The choice of content and methodology are made in-situ even though the choices are already planned. That, which is seen in the actual teaching is a compromise and a combination of the intended and what is possible. A definition of didactics can be given an alternative form.

The anthropology of didactics has an interest in the following examples of circumstances that occur in the classroom:

- ◇ Different lesson sections takes more or less time than planned.
- ◇ Lessons can not be completed as it should be (based on general didactic considerations).
- ◇ The interaction between teacher and students will turn out different than expected (Wedin, 2007) and sometimes didactic collapse (Kroksmark, 1997).
- ◇ Interaction, which turns out differently, may be a deliberate feature of what is taking place (not always randomly or by chance).
- ◇ Something that was planned and perceived, in a certain way, by researchers, for example, "as scaffolding" in an analysis of ZPD (Jadallah et al, 2011:197) can, in fact, be piloting (a frame factor concept) if you make an alternative interpretation of the vignette presented at Jadalla et al.. What is needed is knowledge of teachers' and pupils' interaction before the episode (the vignette below) and a feel for how this is realized in the pupil (it may be an example of superficial learning? How is the concept understood by the pupil?):

Teacher: ... Remember we I'd talked about the weatherman and we said that weatherman does this? What does the weatherman do?

Student 4: Give a ...

Teacher: What does he do when he tells us it's going to be a beautiful weekend?

Student 4: Prediction!

Teacher: Right. You remembered that big word. And what do we do when we predict about the story?

Student 4: We think about what might happen.

Teacher: Next in the story. Right.

- ◇ The teacher has not always the opportunity to listen to students' small-talk (Schoultz, Hultman & Lindkvist, 2005), it is invisible and inaudible and can create error learning/collective misunderstanding between students, when they "teach" each other.
- ◇ A tested learning material can operate on a completely different way than the intended. In such a situation there is a designed material and at the same time there is a local variation. You could say that context takes care of the design and change it, a local adaptation, a translation or an editing process (Sahlin & Wedlin, 2008).
- ◇ An understanding of how classroom dynamics affects the teacher will facilitate our understanding of how this in turn affects didactics. From a strictly subject didactics point of view, a teacher's actions can be understood as inappropriate/inaccurate but when the teacher presents its action with reference to the situation and students it may seem logical.

Reflections on didactics can be given a different content if we take into account the local events in practice. It then becomes something else, not a didactics with flaws. Teachers need to manage two logics, on the one hand the planning logic where the official and formal requirements are present and on the other hand a practical logic where what happens in class, to a large extent, affect the content (Hultman, 2008).

It is not always possible to implement planning in practice. Another factor is that it is difficult to obtain clear information on how planned actions, via classroom interactions, reaches the student. The latter can in part be studied via video recordings where you clearly "see" what attention degree different students display. But even then, you can't safely "see" how an individual student interact with and receive the content. In direct interactions between the teacher and student we can, with the help of transcriptions (see example above), understand the student's situation and grasp which learning that occurred (Nuthall, 2005).

When you perceive didactics as a situated practice the bullet points above becomes important. In this definition of "didactics" the focus is "practice". Such a theory should provide an understanding of the factors that influence a teaching situation. These factors are all known circumstances such as the teacher, the pupil, the subject and the situation (school, municipal, country).

The individual teacher can't consciously take account of all factors in advance but must deal with the situations that arise in action. The teacher's experience is of utmost importance. And much is the same, case-by-case, but although there are often variations on a theme.

A definition of didactics thus becomes those choices, the conduct and the circumstances that create situations in the classroom - and that facilitates or inhibits learning. When-, What- and How- questions is answered from the inside. The choice of timing, content and method is controlled partly by internal circumstances and the decisions the teacher has to take "on the spot". This can be clearly seen when mapping the didactic process (lecture sequences) and when we follow the teacher's plan in to the introduction of the lesson and to further implementation and on to the ending of the lesson (Löfgren, Schoultz, Hultman & Björklund, 2011). Sequence two to four can markedly differ from the first (the plan). And the transitions between the sequences as well.

In this way, we can say that we are back to the original ideas on didactics as the art of teaching. It is no longer only experiential knowledge but know-how that is based on a deliberate schooling and a quest for evidence-based learning. At the same time we need a better understanding of classroom dynamics and a deeper understanding of situated didactics.

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