

INTENTIONS FOR LEARNING MATEMATICS

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The aim of this presentation is to discuss a theoretical framework for researching student's intentions for learning mathematics for education from a social cultural perspective. I will combine the theory of identity by Sfard & Prusack and the theoretical notions of foreground, intention and learning by Skovsmose.

INTRODUCTION

How do student teachers go about the business of learning about learning and teaching mathematics? Research has shown that often teacher education has not had the impact on the students that is expected (Ponte & Chapman, 2008; Gellert, 2009). In my Ph.D. project I am focusing on the students intentions for learning by participating in the mathematics teacher education. The learning actions the students perform, at the teacher training college, I see best described as learning by participation in the discourses of teaching mathematics, thereby highlighting the link between the education and the practices. This approach also embraces the unique feature of the teacher education that “*what they are learning is also how they are learning*” (Liljedahl et al., 2009, p. 29). Student teachers communicate about mathematics and the learning and teaching of mathematics, and thereby they participate in the use of objects, mediators and rules specific of the mathematics teacher discourse (Sfard, 2006).

For students to benefit from their learning actions according to the intentions behind the learning activities, students' intentions for learning need to intersect with the intentions behind the teaching. Whereas the intentions behind the teaching activities are traceable along the way from the official curriculum to the enactment of the educator in the teacher education, the students' intentions are a more difficult matter to research. My aim for this paper is to combine the notion of intentions based on the work of Skovsmose (1994) and a discursive approach based on the work of Sfard and Prusack (2005) to build a theoretical framework for researching the mathematics teacher students' intentions for learning.

INTENTIONS AND IDENTITIES

In my attempt to characterize student teachers' intentions for learning my starting point will be (Skovsmose, 1994) where the notion of *intentions for learning* is developed as a part of a theoretical setup around learning in action. The basic idea is that the intentions for learning, connected to a learning action, spring out of a person's dispositions, characterized by foreground and background (Alrø, Skovsmose & Valero, 2009; Skovsmose, 1994).

Sfard and Prusack (2005) see identities as narratives about individuals that are reifying, endorsable and significant, and divided into actual– and designated identities. Learning in this context is the bridge between the actual identity and the designated identity seen as being able to participate in a (mathematical/educational) discourse (Sfard, 2006). I would like to argue that dispositions can be understood as a certain kind of identities (narratives of first kind – see later) with foreground equivalent to designated identities and in similar way background equivalent to actual identities. This makes a connection between identities as narratives and intentions for (learning) actions. Such a connection has already been suggested in (Stentoft & Valero, 2009), but I would like to elaborate it further focusing on the notion of intention.

Connecting foreground/background and identity

Let us consider the following small extract from an interview [1] about participation in the teacher education.

Interviewer: Why did you choose mathematics as your first main subject?

Student: I have always been good at mathematics. I like that there is one right answer to the questions. Not like it is in Danish, where you can discuss everything.

Here we see a student, who tells a story about herself being good at mathematics. It is clearly a part of her background, and a reason for choosing mathematics as her first main subject. It is also a narrative told by her about herself to the interviewer. It is reified by the fact that it is a story that stems from a number of actions, in which she has shown to be able to do the mathematical tasks asked of her. It is significant as it is given as part of a reason for choosing mathematics. It is only partly to be in coherence with the rest of the answer, but it is sufficient for this example.

My argument is in general, that foreground/background always will be narratives of the first kind (aAb) (Sfard & Prusack, 2005) since foreground is defined as a person's interpretation of her own future possibilities. Similar is background defined as a person's history made of socially constructed network of relationships and meanings. Whenever a person (a) relates to narratives of second or third kind, it will happen by retelling the story. This will make it a narrative of the first kind (aXb), where (X) is a narrative in itself of either type (bAa) or (bAc), and as such a part of that persons dispositions (foreground/background).

When we look at the above statement, we can see that she in this interview setting presents an expectation of liking mathematics at the teacher training college more than Danish, based on her understanding of what mathematics is. The student choosing mathematics because she is good at it, which relate to her background, can both be seen as the student intending to do well at the study to become a mathematics teacher, or the student intending getting through the study as easy as possible. That is two different intentions relating to the same statement, that we will have to explore

further, looking at other parts of the interview. This shows that researching students' intentions is not a straight forward task, and that there will always be an element of interpretation in creating a picture of the students' intentions for learning about learning. This brings me to a discussion of how to research intentions of learning.

RESEARCHING INTENTIONS FOR LEARNING

The intentions come to exist through the learning action —the participation in the discourses— and are as such related only to that particular situation with no special representation that exists prior to the action (Sfard & Keiran, 2001). An account (in retrospect) of the intentions behind a given action will always be a reconstruction relative to the context in which it is told. By virtue of that new context the intentions will be different, but bear a 'family resemblance' to each other (Lerman, 1998). Focusing on the participation I will, Inspired by Anscombe (2000, 1957) divide intentions into three categories: 1) Intentions of a given act of participation, 2) Intentions of obtaining B by doing A and 3) Intention stated without followed by an act of participation.

Another way to look at intentions is to focus at the expectations (aims and goals) characterised by different dimensions:

- Expectations narrated in different timeframes in the sense that they can relate to a) expectations to be fulfilled here and now or b) expectations that reaches in to the future.
- Expectations relate to different narratives within either foreground or background.
- Expectations are always relative to the context in which they are formulated and the intension behind the words (Lerman, 1998).

In the above example we saw the student having expectations for the future building on her background, and we saw her making a choice of subject to obtain something else, even thou it is indecisive what it is she wants to obtain. This indicates that these two ways of looking at intentions can be a fruit full start in looking at the empirical material recognizing, that evaluating the material will most likely produce yet other ways of describing students' intentions for participating.

CONCLUSION

In this paper, framed in a discursive view on learning, I have presented a notion of intentions, which opens up the possibilities of researching students' intentions for learning by participating in mathematics teacher education. By focusing on students' dispositions as narratives and the relations to intentions, I am developing tools helping me to interpret students' intentions relative to these narratives, and thereby enabling me to look for the needed intersections of students' intentions for participating and the intentions behind the curricula taught.

NOTES

1. This interview was conducted as a pilot study in my Ph.D. project. I had group of three students who commented on results from a small survey. The statement is translated from Danish by the author.

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