

# An Inclusive Perspective on a Pedagogy for Students in Special Needs in Mathematics

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This paper is part of an on going project on investigating mathematics education for students in special needs in mathematics. In this paper the aim is to initiate the development of an explanatory framework for understanding critical factors in the learning of mathematics for students in special needs in mathematics (SSM) from an inclusive perspective. In order to investigate this we will take the perspective of pedagogues involved in the situation of students in SSM.

A relational perspective on mathematics difficulties stresses the need to consider in detail how the teaching and learning activities in question effect the students' learning in mathematics (Dalvang & Lunde, 2006). The present project adheres to the relational view in striving to reach an understanding of mathematics difficulties from an inclusive perspective (Lindeskov, 2006).

In an inclusive perspective, students and their mathematical understanding are not considered isolated and de-contextualized units. Mathematical understanding is viewed as cultural and social phenomenon. As a social phenomenon, we seek explanations to students' learning difficulties in the teaching of mathematics, where "we strive to identify and remove all barriers to learning for all children" (Ballard, 1999, p. 2). When inclusion is effective from a learning perspective, all students actively belong to and participating in the current practice and students' different abilities are seen as assets (Farrell, 2004). The base of inclusion is then to value diversity rather than assimilation (Ballard, 1999). Nilholm (2006) emphasizes this by stating that the inclusive school is based on the diversity of children. Consequently, with an inclusive perspective in mathematics education, all students' skills and abilities is taken into consideration promoting learning in the specific teaching situation. However, we claim that there are still much to learn regarding the meaning of inclusion and the identification of factors that appear critical in the students' learning and how different factors work and connect regarding inclusive teaching in mathematics.

This investigation of inclusion in mathematics education is grounded in a socio-constructivist perspective on learning. This means that we look carefully into how the learning of mathematics is integrated to how the learner perceives social and cultural demands, expectations and possibilities of the situation in which the learning takes place (Nilsson, 2009).

The overall principle of this perspective is that learning is considered to be a process of belonging and participation. For the learner this means an engagement

and contribution to the practice (Wenger, 1998). The engagement process involves both acting and knowing in the practice, which includes “both the explicit and the tacit” (ibid, p. 47). This means that the practice includes all visible representations and all implicit and underlying elements (Wenger, 1998).

We will investigate inclusion from the perspective of pedagogues. In terms of participation and contextualization this means that we look at how the teacher and the remedial teacher in mathematics allocate the problem of including SSM to the mathematical practice of the class. To do this we need a more fine-grained framework, identifying ways to participate in the mathematical practice, to be included. Asp-Onsjö (2006) talks about *spatial*, *social* and *didactical* inclusion. Spatial inclusion basically refers to how much time a student is spending in the same room as his or her’s classmates. The social dimension of inclusions concerns the ways in which students are participating in the social play with the others. Didactical inclusion refers to the ways in which student’s participation relates to a teacher’s teaching approach and the way in which the students engage with the teaching material that the teachers may supply for supporting the student’s learning of mathematics. These three analytical categories will serve as a base in developing a more fine-grained explanatory framework, aimed at increasing our understanding of how students in special needs in mathematics are participating, develop their way of participating or become restricted from participating in the school mathematical practice.

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