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**Students’ participation in mathematics in inclusive settings**

Malin Gardesten
Linnaeus University, Sweden; malin.gardesten@lnu.se

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The latest international comparative studies have shown that Swedish students’ achievements have increased slightly. However, at the same time, the equity in Swedish mathematics education has decreased, as in the difference between low- and high-achieving students’ attainment (Swedish National Agency for Education, 2019). Since differently achieving students are taught in the same classroom in Sweden, the teacher becomes an important factor in including students in need of special education in mathematics to improve their achievement. Well-known research in mathematics education emphasizes the importance of teachers’ specialized content knowledge when teaching mathematics (e.g. Ball et al., 2008; Rowland, 2013). In addition, results from studies in inclusive education show the importance of pedagogical relational teachership (Ljungblad, 2022), particularly for students in need of special education. By combining these two traditions, something which has rarely been done, new insights into inclusive mathematics education can emerge. In this study, the mathematical classroom is viewed as a social practice aiming to gain more knowledge about inclusive mathematics education. Inclusion can be spatial, social and didactical (Asp-Onsjö, 2006). This study adopts an understanding of students’ mathematical learning in social settings related to didactical inclusion, as this dimension allows for mathematics teaching that could facilitate learning mathematics together with peers. The research question is: Does the enacted mathematical and relational knowing of teachers enable students to become didactically included in mathematics, and if so, how?

**Conceptual framework**

When studying didactical inclusion, viewing the mathematical classroom as a social practice, Wenger’s (1998) theory on *communities of practice* (CoP) is used. The three modes of belonging, *engagement, imagination* and *alignment* are used as a conceptual framework to understand students’ participation in mathematics. Participation through engagement implies active involvement where the individuals contribute to the joint enterprise and develop a shared repertoire. Participation through imagination is a creative process transcending engagement, enabling us to create new images of the world and ourselves. Participation through alignment implies an individual aligning in relation to a CoP the individual is a member of, with rules, norms and expectations negotiated in the CoP.

**Methods**

In collaboration with five teachers working with an expressed inclusive approach in two classes at two different schools, video-recorded observations of mathematics lessons were conducted during a school year. Six mathematics lessons were video-recorded in Grade 3 and five in Grade 5. Transcriptions of the video recordings were analyzed in two steps. The first step was deductive, using codes of the *Knowledge Quartet* (Rowland, 2013) and the taxonomy of *Pedagogical Relational Teachership* (Ljungblad, 2022). This analysis identified instances where the teachers enacted mathematical and/or relational knowing, building three categories of instances. The next step was
inductive, focusing on didactical inclusion in each of the three categories using the concepts of CoP described above.

**Results and discussion**

The results indicate that when the teacher enacts mathematical knowing *in combination with* relational knowing, the students participate in the community of classroom mathematics. That is, there were increased possibilities for spatial and social as well as didactical inclusion. When a teacher enacts only relational knowing, the students are spatially and socially included but participate in mathematics only in a peripheral way. Mutual engagement here mainly focused on *conducting an activity*, not negotiating the content. When a teacher enacts mainly mathematical knowing, the students participate spatially and socially according to prevailing social norms, but not all students are invited to participate in mathematics. However, it is possible this, in the long run, will make it possible for more students to “enter the event” later (Wenger, 1998, p. 203), and then become able to negotiate the shared repertoire and become more central members of the community of classroom mathematics. One implication for inclusive mathematics education is to consider also the relational aspects of teaching, for example the interactions between the teacher and student.

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**References**


