

# Developing Student Interaction in Multilingual Upper Secondary Mathematics Classrooms

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## **Student communication in upper secondary mathematics classrooms**

In this short communication, we review some of the literature on student communication in upper secondary, multilingual mathematics classrooms. We suggest that the amount of research in this area is limited. As a consequence, we suggest some research questions for a research project in multilingual schools in Malmö.

We see this topic as being valuable in understanding how to improve teaching of mathematics in upper secondary schools in Sweden, where Skolinspektionen (the Swedish School Inspection) has highlighted a number of issues. In regard to the first mathematics course, Skolinspektionen (2010) stated that students did not gain sufficient prerequisite skills, such as problem solving or being able to express themselves orally and in writing. Individual work dominated and discussions about mathematics were not given enough time. As well, students claimed that the mathematics lessons were boring and monotonous and that they focused on getting correct answers and not on determining the reasonableness of their answers.

With a change in the mathematics syllabus in 2011 (Skolverket, 2011), communication in mathematics has been given more attention and, in the national mathematics tests, an oral component has been introduced. This is similar to approaches in other parts of the world, which also value communication in supporting students to think mathematically. However, little research appears to have been conducted in upper secondary classrooms on this issue (see Goos, Galbraith & Renshaw, 2002; Forster & Taylor, 2003).

## **Multilingual Classrooms**

The need for more communication seems particularly pertinent in multilingual classrooms. van Eerde and Hajer (2009) claimed that “learning mathematics and second language appropriation cannot be separated” (p. 270). In Sweden, 18 percent of students in upper secondary schools, have a *foreign background*, which means that they are born abroad or born in Sweden with both parents born abroad (Skolverket, 2010). In Malmö, 46 percent of the students have a foreign background.

Generally, research on communication in the multilingual mathematics classroom has been conducted in primary and lower secondary schools. This research suggests, for example, that it is “crucial that the pupils verbalize their ideas and thoughts and address dialogue partners” (Brandt & Schütte, 2010, p. 111). Also in multilingual classrooms, *code-switching*, which means that students switch between two or more languages, appears to be valuable (see Setati, 2002).

### **Establishing a research project on student communication**

From the literature, we have found that research on student-to-student interaction in multilingual upper secondary classrooms is limited. We, therefore, suggest that there is a need for a new research project that aims to answer the following research questions:

How do teachers and students perceive the impact on students’ learning from increasing student-to-student interactions in multilingual secondary mathematics classrooms? What pedagogical practices do teachers and students find effective? Are there benefits for students who do not have Swedish as their dominant language in “talking more mathematics”?

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