

### **Mathematics education; discourse, knowledge and power**

In my study, concerning *minority students in bilingual mathematics classrooms* in Sweden, I have followed bilingual teachers and students in mathematics classrooms for almost two years. The mathematics teaching and learning were going on in Swedish and Arabic in the *Mother-tongue teaching of mathematics project*. In this short presentation I would like to consider theoretical perspectives, how and what usefulness they may have. It also brings methodological consequences. A theory I wish to try as a thinking lens derives from Michel Foucault. Foucault's work is by some looked upon as a paradigmatic example of 'postmodern' thought. Mathematics education and postmodernism yet have rarely addressed each other (Walshaw 2004).

Within my study sociocultural influences are important but as I find discourses (Gee 1999), and structures of power as well as concepts of knowledge present in the bilingual mathematics classrooms context I look for different ways of analysing empirical data. Foucault's thinking include three key concepts; discourse, power and knowledge (Walshaw 2007).

There are concerns about minority students' marginal performance in mathematics in Swedish classrooms (PISA 2006, Skolverket 2007). Often students' low performances refer to deficiencies that call for remediation in the students, in their languages or cultural backgrounds. One example is their "lack of Swedish ness" (Parszyk 1999, Runfors 2003).

Instead of looking at deficiencies it is possible to view the languages and cultural backgrounds of the students as resources for learning mathematics and as a potential for their future lives (Moschkovich 2007).

If mathematical knowledge is to be looked upon as socially and culturally constructed rather than found, mathematical knowledge and meanings have to be located in social practices – in discourses of mathematical communities as in a mathematics classroom. Learning then occurs collaboratively in the context of shared events and as each one's experiences, languages and cultural backgrounds are valued as resources for learning mathematics – students become empowered (Cummins 2000). Walshaw (2007) refers to Foucault's concept of power and says it is constituted through discourses and that power circulates in practices. She writes:

In the course of Foucault's work, power came to be considered as something quite different from coercion, prohibition, or domination over others by an individual or a group. He took issue with analyses that express power merely in centralised and institutionalised forms in which an individual or group deliberately imposes will on others. ... As it turns out, Foucault maintained that power underlies all social relations from the institutional to the intersubjective. (p 20, 22)

Foucault is redefining power as coextensive with knowledge (Walshaw 2007).

In one of her articles Setati (2005), a South African Mathematics Education researcher, claims that language is always political, and language is a symbolic resource in educational as well as social and employment markets (Bourdieu 1991). Setati asked what language and discourse practices teachers used in multilingual mathematics classrooms. She found that two categories of mathematical discourse emerged; procedural and conceptual. At a micro level of the classroom interaction language was political, as power relations existed in the classroom. The mathematics teacher projected herself as a certain kind of person in a certain kind of activity. English was used in procedural discourse, which according to Setati highlighted the political tension in the multilingual classroom. English was also used as the language of regulation and assessment - the language of authority. Students' (and teachers) mother tongue – Setswana – was used as a language of solidarity and contextual discourse. Setswana also functioned as the language of conceptual discourse. The teacher's personal

experience made her struggle with the tensions between her identities as an African and as a mathematics teacher. It was evident in the way she used languages but also in the discourses she used during teaching. She was “aware of the political role of language during apartheid in South Africa and the power of English in enabling learners to gain access to educational and socioeconomic resources in South Africa.” (p 460).

It is not possible to simply transform South African research findings to a Swedish context. But it might be useful to analyse empirical data from multilingual mathematics classrooms with inspiration from theories as that of “Knowledge can’t be separated from power”, “language is always political” and “power relations exist in multilingual mathematics classrooms”.

Since 1997 views on students home-languages or mother tongues have changed. There has also been a shift in official policy which language to use for instruction in mathematics education. The *Mother-tongue teaching of mathematics project* enacts an example. But still there are hesitations among teachers, politicians and administrators. Sjögren (2002) writes:

It’s not so much Swedes themselves who are ‘Swedish,’ but institutions-the Swedish schools, parliament, police, press, and so on. And being institutions, they are extremely slow to change. They support the existing ideology and way of thinking. (p 16)

This takes me back to Foucault. Is it possible to use his theory, connecting knowledge, power and discourses, as a way of understanding teaching and learning in bilingual mathematics classrooms in Sweden? What does it implicate to be a bilingual student in a bilingual mathematics classroom in Sweden? What Discourses, mathematical and others are used? How do bilingual teachers use the languages, in what Discourses?

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