

SAME QUESTION DIFFERENT COUNTRIES: USE OF MULTIPLE LANGUAGES IN MATHEMATICS LEARNING AND TEACHING

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Awareness about cultural and linguistic diversity in school mathematical practices has led some researchers towards exploring the use of multiple language use as a resource (rather than a constrain). The proposed symposium aims to discuss how research; a) analyses the complexities of multiple-language use in school mathematics and highlights how students (and teachers) are caught in dilemmas of language choice, and b) problematises the taken for granted dichotomies of language choice and explores possibilities for theorising how multilingual students and their teachers can challenge hegemonic discourses in school mathematics practices and engage with(in) mathematical learning identity work.

SYMPOSIUM RATIONALE, AIM AND PLAN

Our concern for how children in bilingual and multilingual classrooms learn mathematics best, has led us to develop research with children from marginal communities in Greece, South Africa, Spain, and USA. These are children of immigrant or non-dominant ethnic background, as well as, previously disadvantaged African students in South Africa. In our work, we move toward a discourse-based critical perspective that takes into account both the socio-political role of language and the backgrounds of the students to explore the conditions of participation and identity change of bilingual and multilingual learners in mathematics classrooms. In this symposium we draw on our local data to offer a joint view on school mathematical practices and multiple-language-use in varied sociocultural contexts. Our aim is to comment on questions concerning how certain theoretical perspectives have an influence on the analysis of our data, how certain discourses and policies serve to perpetuate marginalisations and inequalities in a variety of school practices, and how certain theorisations can work towards encouraging teachers and students to imagine alternative possibilities. The symposium will take place in one session (90 minutes). A combination of presentations and discussion will be used to debate the above issues. Each one of the presentations will last 15 minutes, allowing approximately 30 minutes for a collective discussion to take place.

Troubling language priority: Reversing identity fortune: Opening up mathematics learning? by Anna Chronaki

'Mathematics runs in our blood!' says 12 year old Panagiotis when asked to calculate mentally 3 digit numbers. Panagiotis has considerable experience of what we call 'real life mathematics' as he, from an early age, participates actively at his family business. But, when Panagiotis has to cope with formal arithmetic at school he confronts difficulties in expressing himself. Although his use of Greek is moderate, he struggles over finding the proper words in explaining problem solving processes. *'Our language is forbidden here'* says Panagiotis, explaining that *'[...] when we talk Romani during breaks they think we curse'*. As the Greek school curricula practices are still based on monolingualism, unavoidably Romani language-use along with its users –Greek Gypsy children- remain marginalised, oppressed, silenced and become 'other'. No-language literally results into no-voice for them. The complex relation amongst political-ideological factors and language use in bilingual communities has been highlighted (e.g. Bourdieu, 1991) and has been argued that the hegemonic imposition of monolingualism has negative effects on academic, economic and political arenas of individuals and communities alike. The present paper, is based on earlier work (e.g. Chronaki, 2005), and aims to discuss a politics of possibility. In other words: Can we create, by means of a 'teaching experiment', a stage that 'troubles', in Judith Butler's¹ words, hegemonic discourses about who is constituted able to do school mathematics? Can we 'trouble' hegemonic discourses concerning who sets the rules and who leads the language-game(s) for performing mathematical rituals by deliberately shifting roles in the course of the everyday classroom life? Can we use this on-stage performed 'troubling' metaphor for engaging learners from varied cultural and social backgrounds in dialogicality?

Mathematics in multilingual classrooms: from understanding the problem to exploring possibilities by Mamokgethi Setati

Research on multilingualism in mathematics education all over the world has sought to understand the problem of access and success of students who learn mathematics in a language that is not their home language. In its exploration this research has explored the different ways in which languages are used in bilingual and multilingual mathematics classrooms, the range of discourses and language practices that teachers and students draw on as well as the nature of the mathematics that students are exposed to (e.g., Adler 2001; Moschkovich 2002; Setati, 2005,). In this presentation I will give a brief description of what we know now as a result of this research. I will argue that while the questions that research in this area of study has sought to understand have to do with mathematics, language as well as pedagogy, they are all concerned with the uneven distribution of knowledge and success in mathematics. I will further argue that while there is agreement on what shapes the research, this area

¹ Judith Butler is an American post-structuralist philosopher, who has contributed to the fields of feminism, queer theory, political philosophy and ethics.

of study is plagued by dichotomies of language choices and theoretical perspectives, which in my view contribute to the slow growth of knowledge and limited theorising. I will then describe a theoretical stance that I have adopted in a quest to explore possibilities for teaching and learning mathematics in multilingual classrooms. Drawing on data collected in South African classrooms over the past ten years, I will open up a debate and discussion on what this theoretical stance enables us as researchers to 'see' theoretically and multilingual students and teachers to 'do' mathematically.

Bilingual students acting as monolingual in the mathematics classroom by Núria Planas

Catalonia, North-Eastern Spain, is an autonomous region of more than seven million people with considerable immigration. Recent data indicates that immigrants or children of immigrant parents represent sixteen per cent of the total population. This percentage is even higher in the urban area of Barcelona, where twenty-eight per cent of the population has recent immigrant origins, including a fifteen per cent of first and second generation immigrants from South-America. In this context, the achievement in mathematics of immigrant students is much lower than that of local students whose first language, Catalan, is the language of teaching. This low achievement can be attributed to a variety of reasons including the knowledge of the local language. However, it is needed to pay special attention to social issues related to the use of the languages represented by the groups of students in the classroom. In my recent studies (e.g., Planas, Iranzo & Setati, 2009) I explore when, how and why students from a non Catalan speaking background prevent from participating with other groups of students that have the language of teaching as their first language. I draw on social theories to argue for the ways talking can be used to reduce opportunities for them to engage with classroom mathematical practices. My findings show that the classroom as a culture and the students as individuals send conflicting messages about the values of bilingualism through the separate use of languages. The use of Catalan, the official language of teaching, in the whole group and the development of a consciousness about the appropriate language in well-defined situations (small group vs. whole group) seem to have an influence on the production of monolingual strategies and monolingualism discourses.

Language policy and participation in the mathematics classroom by Marta Civil

In 2000 the voters in Arizona passed Proposition 203 that limits bilingual education in the schools in that state. More recently those students who are classified as English Language Learners (ELLs) have to spend four hours per day learning English (usually for one year), thus leaving little time for other academic subjects, as well as creating in many cases a school within a school (Valdés, 2001), where the ELLs are kept separate from the non-ELLs for most of the school day. In this presentation I will focus primarily on a mathematics class of eight seventh-graders (12 year-olds) during the first year of the implementation of the 4-hour separation model. These

eight students were all of Mexican origin and classified as ELLs; the teacher was also Mexican but due to the language policy in place, she used English most of the time. I worked with the teacher and this group of students from February till May. During that time we implemented an approach in which students worked in small groups (where they spoke practically always in Spanish), wrote (in English) about their solution processes and from time to time also presented their approaches to the problems to the whole class (in English, switching to Spanish). We videotaped 30 hours of class and my analysis centers on issues of participation, role of language, and quality of mathematical discourse (explanations, reasoning). My focus in the presentation will be on these students' high level of competence as mathematicians once they felt free to use their home language to express themselves. The situation, however, is not as simple as suggesting the use of their home language; interviews with these students show a deep awareness of their being in a different section of the school and in most cases their desire to leave that section and be with the other students, which means becoming proficient in English as soon as possible. This creates a dilemma in terms of language choice and use in the classroom. My goal is to engage in a discussion around this issue during the symposium.

REFERENCES

- Adler, J. (2001). *Teaching mathematics in multilingual classrooms*. Dordrecht: Kluwer Academic Publishers.
- Bourdieu, P. (1991). *Language and symbolic power* (translated by G. Raymond and M. Adamson). Cambridge: Harvard University Press.
- Chronaki, A. (2005) Learning about 'learning identities' in the school arithmetic practice: The experience of two young minority Gypsy girls in the Greek context of education. *European Journal of Psychology of Education*. Special issue on 'The social mediation of learning in multiethnic classrooms', guest editors Guida de Abreu and Ed Elbers, 20 (1), 61-74.
- Moschkovich, J. (2002). A situated and sociocultural perspective on bilingual mathematics learners. *Mathematical Thinking and Learning*, 4, 189–212.
- Planas, N., Iranzo, N., & Setati, M. (2009). Language switching with a group of bilingual students in a mathematics classroom. In M. Tzekaki, M. Kaldrimidou, & H. Sakonidis (Eds.), *Proceedings of the 33rd Conference of the International Group for the Psychology of Mathematics Education* (vol. 4, pp. 393-400). Thessaloniki, Greece: PME.
- Setati, M. (2005). Teaching mathematics in a primary multilingual classroom. *Journal for Research in Mathematics Education*, 36(5), 447-466.
- Valdés, G. (2001). *Learning and not learning English: Latino students in American schools*. New York, NY: Teachers College Press.