Commentary on the Chapter by Richard Barwell, “Heteroglossia in Multilingual Mathematics Classrooms”

Heteroglossia and “Orchestration” in Multilingual Mathematics Classrooms

Núria Planas

Diria que m’agrada més parlar català a classe de matemàtiques, perquè és més elegant, com les matemàtiques també són més elegants! [I would say that I like to speak Catalan better in the mathematics class, because it’s smarter, like math, they are also smarter!] (Elena, Spanish-dominant speaker, 13-years-old, May 2011)

In his chapter, Barwell draws on the Bakhtinian notion of co-existing voices, heteroglossia, to point to the experience of four tensions in linguistically diverse mathematics classrooms, namely: 1) school versus home languages, 2) formal versus informal language in mathematics, 3) language policy versus mathematics classroom practices, and 4) a language for learning mathematics versus a language for getting on in the world. To further explore Barwell’s points, I bring up the metaphor of orchestration. My idea of orchestration refers to the manner in which various voices are individually used to produce coordinated results. As in the case with instruments in an orchestra, the final production requires successful individual practices with instruments that successfully interact with each other. My main argument here is that heteroglossia needs adequate practical orchestration, on the part of all members in a class: they all need to learn what the others can and cannot do, what distributions of work sound more adequate at each time, why is it that some of the ideas and contributions sound different depending on who introduces them, etc. By interpreting orchestration as something that includes all participants, not only the actions and choices by the teacher, it becomes clearer that students and teachers have lots in common.

Although all members in a class are responsible for good orchestration, it is not easy to identify the orchestrators that have a role in deciding which voices are asked to play more valuable “notes.” In a full orchestra, several instruments alternate their presence throughout the musical representation. Moreover, although the composer may not be physically present, he/she marks the anticipation parts of

N. Planas (23)
Mathematics and Science Education Department, Universitat Autònoma de Barcelona, Barcelona, Spain
e-mail: nuria.planas@uab.cat

the arrangement. Even if there is only one orchestrator for each representation, all contexts are socially and politically charged in such a way that the orchestration cannot be attributed to a single person. In a multilingual mathematics classroom, for instance, a teacher may choose/allow to code switch and promote flexible language practices while teaching. However, other agents also have significant roles in determining the value of these practices. In other words, the understanding of orchestration is not limited to the scenario in which the orchestra with the students and the teacher is placed. It tells a more complex story about broader discourses and relationships within society that highly frame the reading of what happens in a classroom. Throughout the text below, for instance, in my own academic discourse, I use terms like “Catalan teachers” and “late arrival immigrant students” to refer to certain social realities at the risk of unintentionally suggesting monolingualism.

1 Viewing Orchestration in “School Versus Home Languages”

Barwell highlights the stipulation of an official language of schooling as a manifestation of dominant discourses on unitary language in mathematics classrooms. In my research context (Planas 2011), I also elaborate on the institutional emphasis on language, specifically among students whose home language is not Catalan, the language of learning and teaching in the Catalan school system. Despite several discourses on monolingualism all over the world, research has argued in favor of the use of the students’languages in the teaching and learning of mathematics. In Planas and Setati (2009), the analysis of data from small group work in a multilingual mathematics classroom relates the alternate use of the students’ languages to move mathematical participation and thinking forward. However, classroom data in situations of whole group discussion (Planas 2011) show fragile author positions for students who are not Catalan-dominant, and who have come to Catalan almost exclusively through school. Changes in some of these students’ positions are critical in that opportunities for interaction become altered and affect the overall learning situation. This type of changes in positions from small to whole group work is particularly observable in my data. I have always attempted to work in classrooms with linguistically mixed student population. This option has created a good opportunity to explore differences in the behavior of students of Catalan speaking background and those of Spanish speaking background in different social contexts of the mathematics classroom.

Which orchestrations could help shift the tension more toward heteroglossia and away from unitary perspectives? Which are the potential orchestrators for such a task? Are all members of a class ready to take responsibility for orchestrating particular teaching and learning practices? The research in Tucson, Arizona by Civil and Menéndez (2011) highlights the fact that shifts require complex orchestrations that include teachers, students, and close community members. In home settings, Mexican-American students’ voices sound bright while they share their mathematics homework with their parents and when the latter helps the former deal with
tasks presented in English. But when the same students are placed in an English-only mathematics classroom with their teachers and other students, their voices sound very different. This suggests that the interpretation of valorizations as expressed in the classroom cannot be isolated from the interpretation of valorizations in other areas of life in which the students’ knowledge is highly appreciated where they tend to act as orchestrators on the basis of their language and cultural experience.

2 Viewing Orchestration in Formal Versus Informal Language in Mathematics

Barwell points to a second tension coming from the students’ informal expressions of their mathematical thinking and the need to use formal mathematical vocabulary and grammar, which tends to be presented in the official language. In South Africa, Setati (2005) has documented how discussing mathematics in English tends to be more procedural, while sophisticated mathematical thinking is more likely to occur in the students’ home languages. If looking at teachers in Catalonia, there are an increasing number of multilingual classrooms where teachers teach mathematics in English, a language that is neither theirs nor the students’ dominant language. It is claimed that CLIL (Content and Language Integrated Learning) methods aim for the simultaneous learning of content (i.e. mathematics) and a “foreign” language (i.e. international English). However, preliminary findings based on fieldwork in 2006–2007 from one of my students, M. Gallart, show that Catalan teachers have difficulties with modeling mathematical thinking through English and that they tend to use procedural approaches to mathematical activity.

How could the communication of students’ mathematical ideas be facilitated in multilingual classrooms? I agree with Barwell that this question is not easily resolvable. But, again, my position is that at least better orchestrations need to be considered. Which orchestrations can help keep a balance between informal and formal language both in teaching and learning? How students and teachers are able to use language depends on what is interpreted to be convenient in a particular classroom context and which forms of assessment are activated. Research by Enyedy et al. (2008) on practices of revoicing in multilingual mathematics classrooms gives some clues as to how teachers and students can promote a deeper conceptual understanding of mathematics by avoiding an excessive focus on language. In Planas and Morera (2011), practices of revoicing in bilingual mathematics classrooms also appear to be connected with advanced collective argumentation in conversations in which mathematical vocabulary is often reconstructed across languages through a mixture of Catalan and Spanish. It is especially interesting the fact that revoicing often helps move toward more conceptual discourses by means of “repeating” questions in which either grammatical constructions or technical vocabulary have been partially reformulated.
3 Viewing Orchestration in Language Policy Versus Mathematics Classroom Practice

The third tension posed by Barwell relates to language policies penalizing practices of code switching, or at most seeing them as steps on the road to monolingual proficiency in a high status language. Language policies are primarily motivated by political rather than pedagogical issues. Consequently, what is intended in terms of institutional norms may become an obstacle in terms of learning. The interpretation of the effects of language policies on learning has a strong political dimension, too. Based on part of the findings drawn from the PISA 2009 Report for Catalonia—Spain and mathematics (OECD 2010), one of the mainstream journals in my country—El Mundo, Catalan Edition—published the rate of failure for Spanish dominant students (42.62%) and compared it with the rate for Catalan dominant students (18.58%). The title of the column in the journal was “Language and school failure in Catalonia.” Here, the main reason for the difference was attributed to Catalan being the language of learning and teaching and to “the impossibility for Spanish-speakers to be schooled in their language” (El Mundo, Catalan Edition, 07-12-2010, http://www.elmundo.es). The fact that over 80% of 42.62% were Latin American immigrant students and/or children from immigrant families was not mentioned. Moreover, there were no references to the parallel system of “special classes” for late arrival immigrant students, with fewer hours of mathematics per week than those in regular classes. Nowadays, the social debate in the media is still primarily centered on the negative educational effects of having the learning of “key” subject areas such as school mathematics distracted by the learning of language.

If we react to the impossibility for Spanish-speakers to be schooled in their language by changing the language of learning and teaching, then we have other groups facing the challenge of learning mathematics in a language that is not their own. Therefore, it makes sense to search for alternative solutions at the level of school mathematics and classroom practices. Which practical orchestrations can work toward less restrictive interpretations of language policies? Like Setati et al. (2002), I see practices of code switching, especially when used by both teachers and students, as a tool for performing more multilingual exploratory talk and less monolingual procedural thinking. When teachers take on the role of bi/multilingual and share this with students, they can improve their interactions with them and teach in new and distinct ways that foster content instead of unitary language systems. If possible, teachers must be willing not only to talk mathematics with their students but also to model talking mathematics across languages and gain reflexivity. This approach, of course, does not solve the question of how monolingual teachers in multilingual classrooms can gain effective reflexivity with all students.

4 Viewing Orchestration in Language for Learning Mathematics Versus Getting On in the World

The last tension in Barwell’s text illustrates the preference of many students for the learning and teaching of mathematics in a language that is not their own in spite
of additional personal difficulties that such scenarios may bring. Again, the debate is not only about language and/or mathematics, but it is also about the political role of language and the complexity of the context in which the mathematics is taught and learned. In Setati and Planas (2012), what can be seen is that students and teachers have a clear preference for one language (Catalan in my context, and English in South Africa). From most of the students’ and the teachers’ perspectives, learning and teaching mathematics in Catalan/English is not so much about choice; it is just how things should be. There is also an implicit message of “wanting the opportunity.” Students believe that without fluency in Catalan/English, they would not have access to social goods such as higher education and qualified employment.

It is not surprising that students refer to the social dimension of access and more explicitly to the right to choose the language for their learning of mathematics. This result, nevertheless, tells again a more complex story than the issue of choice itself. It speaks of some languages that are not supported enough within society, while other languages are marked with ideals of social promotion and academic success. In this situation, which are the potential orchestrators, if any? Do they look like 1) particular students, teachers, and close community members or 2) political agents who are not represented by a single person? In my view, we need orchestration from both groups. They work differently as they attempt to arrange significant aspects of the initial “piece” and, thus, need to be analyzed carefully. As researchers and mathematics educators, our task is to make progress in understanding the intentions of all agents and the extent to which certain intentions might better facilitate an efficient orchestration of heteroglossia in multilingual mathematics classrooms (see, e.g., Rivera and Becker 2008). The final ideal representation would not let one language group advance at the expense of the other.

There is always room for negotiation and re-distribution of identities: any social and political discourse may be contested and become the basis for the construction of alternative identities. Even when institutions behave as monolinguals, monolingualism is supported by law and issues of language identity may be presented as non-negotiable, individuals and groups may struggle for voice by reconstructing what others expect from them—and what they themselves have come to develop as self-representations. (Planas 2011, p. 131)

References


