VOICES OF NON-IMMIGRANT STUDENTS IN THE MULTIETHNIC MATHEMATICS CLASSROOM

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Research studies on multiethnic mathematics classrooms tend to focus on the perspective of the immigrant student (or the language / ethnic “minority” student) and less on that of the “local” student (or the “non-minority” student). However, the representations that both groups of students have on each other are crucial towards the construction of learning opportunities in diverse mathematics classrooms, which are quite common in many countries. In this paper, we reflect on three aspects – group work, mathematics talk and alternative approaches to problems – as viewed by non-immigrant students of a multiethnic mathematics classroom.

INTRODUCTION

Research studies on multiethnic mathematics classrooms tend to share a focus on conflict, that is, whether looking at issues of power, of discourse, of participation (e.g., Setati, 2005; Vithal, 2003), the concept of the classroom as a conflictive place for learning is often present. Much of this research has centered on analysis of classroom interactions, for example, looking at small groups of students as they solve problems and how these interactions are influenced by who the students are, how they are positioned (by other students as well as by the teacher) or how they interpret the norms of mathematical practice. These studies tend to focus on the perspective of the immigrant student (or the language / ethnic “minority” student) and less on that of the “local” student (or the “non-minority” student). What do “local” students think about being in multiethnic mathematics classrooms? This is the question that we address in this paper. The representations that both local and immigrant students have on each other are crucial towards the construction of learning opportunities in diverse mathematics classrooms, which are quite common in many countries.

CONTEXT

The research reported here took place in a mathematics classroom at a public high school in a low-income neighborhood in Barcelona, Spain. The high school student population was largely Moroccan (60%) and, in particular, 14 of the 28 students in the classroom were immigrants (seven Moroccan, three Dominican, two Pakistani and two Bangladeshi), nine of them being first generation immigrants. By “immigrant” we mean first or second generation immigrant (there are practically no third generation immigrants in our local context yet); by “local” we mean individuals who can trace their origins back for generations to Spain.

We chose this classroom because the teacher promoted a reform-based approach to the teaching of mathematics, thus allowing us to explore three aspects of
mathematical practice that tend to be associated with reform oriented approaches: group work, mathematics talk (hence, language aspects), and alternative approaches to problems. The teacher had collaborated with the first author on a prior research project and was very welcoming of this new project. He had over ten years of experience in urban settings and enjoyed working in schools such as the one where this study took place. We point out, however, that up to that class the students had not experienced a problem-solving approach in the teaching of mathematics. Also, we want to note that all the immigrant students in this classroom had quite a good command of at least one of the official languages (Catalan and Spanish). This is important to note because of the role that language plays in small group work on problem-solving tasks.

METHOD

The main source of data for this paper comes from interviews with twelve 15 and 16 year-old non-immigrant students (seven females and five males). Each student was individually interviewed once for about 30 to 50 minutes during the second and third month of the school year. Interviews were tape-recorded and transcribed. Additional data were collected during informal conversations with immigrant and non-immigrant students after some of the lessons that were observed. The students ranged over different levels of achievement from high to low (as determined by results in mathematics classroom assessments).

The first author conducted all interviews (in Catalan or Spanish depending on the student’s preference) using an interview protocol that covered four general areas: 1) their background with special attention to their schooling history; 2) their mathematics experience as learners; 3) their mathematics experience in their current multiethnic classroom; and 4) their perceptions of learning obstacles as well as opportunities in relation to their being in a multiethnic mathematics classroom. The use of open-ended questions such as “How do you collaborate with your immigrant peers?” provided students with an active role in the research process. This format afforded them the opportunity to formulate their own answers, to seek clarifications from our comments and questions, and to pursue ideas that they felt as relevant and had not been directly introduced.

The data analysis followed Glaser and Strauss’s (1967) constant comparative method. The different pieces of data (field notes and transcriptions of the tapes) were looked at and codified. This process led to the development of themes. We organized data related to points 3 and 4 by means of three initial themes —‘Group work’, ‘Mathematics talk’, and ‘Alternative approaches to problems’— that appeared to be highly related to both learning obstacles and opportunities in the multiethnic mathematics classroom, as seen by most of the twelve students that were interviewed.

SOME RESULTS

In this paper we focus mostly on the third and fourth areas of the interview, by looking at these local students’ references to the three themes we mentioned earlier:
group work, mathematics talk, and alternative approaches to problems. Although our emphasis is on the local students in this study, we bring data from immigrant students in that same classroom to underscore the need to listen to both groups.

**Group Work**

The teacher deliberately used linguistically and ethnically heterogeneous groups. He did so to encourage students to interact across ethnic and linguistic groups, as he had noticed that otherwise students tended to stay within “their” groups. To us, group work is potentially a way to develop joint mathematical practice, although we are aware that different interpretations of norms, students’ status in the class, and teacher’s role in orchestrating group work play a key role in limiting or promoting productive functioning of groups. Alrø and Skovsmose (2002) have argued the benefits, in terms of the communication and the learning, of classroom environments of group work where the teacher plays the role of a consultant.

The local students tended to view group work as a strategy that the teacher used to help the immigrant students, but saw little value towards their own learning:

Marc [high achiever]: Most times we work in small groups, and this is quite a problem for us, at least for me, though I try. We are mixed groups. But you know, what immigrants say they do and what they actually do is not always the same. It is very difficult to talk about math with them, it is difficult to complete the tasks, though I try.

Maria [low achiever]: To learn mathematics with immigrant students? To tell you the truth, it’s very tiring... they need lots of help. I try to help them as much as I can, but when I need to get concentrated on the task, they must wait for my help.

From Maria’s perspective, the help given to immigrants can become excessive under certain circumstances. She experiences the ideas of ‘being concentrated in the task’ and ‘helping the immigrants’ during group work as contradicting. What is interesting to note is that while the local students do not seem to value working in groups as a way to enhance their own learning of mathematics, neither do the immigrant students:

Khadija [Moroccan arrived the year before, high achiever]: I do not like to work in the math groups because I cannot concentrate; everybody talks and I cannot think. Here they do it this way, but it can be done different ways, with more silence.

Harim [Moroccan, born in Barcelona, low achiever]: In the afternoons (at the mosque) we listen to the math explanations, and in the mornings (at school) we listen to other students. The teacher is there but he is not there because we cannot ask him. It’s rather funny.

We are aware that just referring to group work in mathematics is rather vague, as we do not really describe how this group work was orchestrated, nor do we talk about norms of participation. In this classroom, students were given a task that was briefly introduced by the teacher. Students were said to solve the task in the context of their groups and to write down the main mathematical questions that had orientated their
discussions. Neither the immigrant students, nor the local ones were used to working in groups in a mathematics classroom. Some of the immigrant children, like Harim, had access to other schooling experiences, such as the mosque. For him, the learning of mathematics took place there, at the mosque. One of the local students, Mireia, gave us her perspective on the immigrant students going to these other schools:

Mireia [high achiever]: They go to those schools in the evening and they are a bit confused about how things work in this school.

She did not elaborate on what she meant by being a bit confused. Is it because the expectations and norms at the two schools are different and thus these students need to navigate two systems?

**Mathematics Talk**

Closely related to group work is the idea that students have to engage in conversations about mathematics with each other. Moschkovich (1999), raises the point that although an emphasis on discourse could make English Language Learners (ELLs) (in her study she is focusing on Latino ELLs in the U.S.) vulnerable to be assessed as deficient in terms of their language skills, it could also be seen as an invitation for ELLs to engage in meaningful, context-based conversations about mathematics, thus providing them with more opportunities to enhance their learning of language and mathematics.

The new emphasis on mathematical discourse and the new forms of student participation point to the need for Latino students to have the opportunity to engage in mathematical discussions with their peers, with the teacher, and with their whole class (Moschkovich, 1999, p. 10).

In our case, the teacher’s use of linguistically diverse small groups was intended to follow Moschkovich’s suggestion. Yet, the local students focused mostly on “language” as a problem:

Eduard [low achiever]: I always work with Imram, he helps me with the mathematics and I help him with the language. They really need it. Sometimes Imram makes small changes in the words and big changes in the wording, and then the others do not understand him. Then I explain what he means. I don’t mind helping him but sometimes I help him much more with the language than he helps me with the math. Sometimes it is kind of wasting my time.

Imram had arrived from Pakistan six years ago and spoke Catalan and Spanish quite fluently. The teacher explained that Eduard and Imram often did not agree with each other’s ideas in mathematics. Yet, as members of the same working group, one of the expectations was to reach some consensus to bring up to the whole class discussion. The teacher added that Imram did not expect Eduard to help him with language and that he would get tense when Eduard “explained [to the class] what he [Imram] means” as he sometimes misrepresented what Imram had said.

Although it is the case that the immigrant students had a good command of at least one of the official languages for social communication, it is less clear what their
command of academic language was, as this one takes longer to develop (Cummins, 2000). As Khisty (2006) writes,

> Academic discourse competence … is acquired through active participation in the community that uses that discourse…. Without the academic discourse or language, students are systematically excluded or marginalized from classroom curricula and activities (p. 436).

It is very likely that by having the students work in small groups, the teacher was indeed aiming at developing students’ academic language. Which students? We argue that it is not clear to us that only immigrant students need experiences in which to develop academic language. Yet it is possible, like Helena’s quote below suggests, that the local students did not see the use of small groups as a technique to develop their own competence in mathematical communication, but more as a way to once again, help the immigrant students—in this case with language development.

Helena [high achiever]: They put us in small groups and they say that this way we will learn more mathematics, but the real reason is that they do it so that those from outside get a chance to practice our language. I don’t think this is right because I think that these decisions should be based on the mathematics.

Helena talks about group work as being “an occasion” for immigrant students to practice the use of the local languages. In her opinion, the attention paid to the language interferes with the students’ mathematical learning. During the interview, when Helena was asked to clarify what she meant by “decisions should be based on the mathematics”, she said: “They practice our language, and mathematics happens in the meantime. Shouldn’t we practice the mathematics?” Why is it that practices of mathematics talk are not seen as compatible with the learning of the language?

**Alternative Approaches to Problems**

For the teacher, as well as for us, one of the richness of working in multiethnic classrooms is the possibility for multiple approaches to problems to emerge. But to which extent are all these different approaches seen as part of valid mathematics? By pointing out the cultural aspect of certain methods (e.g., by attributing them to an immigrant student) are we contributing to developing an idea of “their” mathematics and “our” mathematics? The second author in her work with preservice elementary teachers in the U.S. asked them to reflect on the article “Mathematical notations and procedures of recent immigrant students” (Perkins & Flores, 2002). Several comments pointed to a belief that immigrant students needed to learn the way arithmetic is done in the U.S. As one of them wrote, “this is nice but they need to learn to do things the U.S. way.”

The local students in the study in Barcelona had similar comments, though some of them did show an interest towards these methods:

Laia [high achiever]: Last week Afzal solved an equation by drawing a kind of diagram. It was interesting, though I missed some details because I was still finishing the task... I often wonder if he feels out of place with our math... we cannot learn everything, our math is already too much!
Pau [low achiever]: Their comments help us make sense of the situations before starting solving the problems, but, anyway, we cannot always start making sense of it like they do. Our math is what it is. And theirs… it is fine, but sometimes it just doesn’t fit in.

Overall, however, there was a shared concern among the local students that they had enough work to do to learn “their own” mathematics and that it was up to the immigrant students to adapt to the local ways of doing mathematics.

Maria [low achiever]: We are not in the classroom to learn their mathematics but to learn ours. That’s what the exams are about. (...) I am not expected to learn Murshed’s way of subtracting.

Sergi [low achiever]: I learn from what others say and do, but you see, in the case of the immigrants, you must be very careful for your own benefit. They learned some mathematics differently and you must know what to learn from them (...). Most of them easily learn our ways… There is a Chinese girl, she was in my class last year. One day, she drew part of a circle with her compass and then she said that she had drawn an angle. The teacher said it was okay because the angle has not to do with the directions of the two intersecting lines but with the idea of amplitude. That girl, she was always listening to us… I often think that she must have many other examples, like the one of the angle, but I’m not going to use the compass when drawing and angle.

Only Sergi referred to the opportunities foregone in making the choice of not integrating different meanings. The year before, he had widened his notion of angle by listening to an immigrant student, and he was aware of having learned from her, though he believed that the local mathematical practices are more appropriate than the immigrants’. How has Sergi developed such a clear perception of which “mathematical contents are not to be learned”?

FINAL REMARKS

The immigrants’ classroom practices are seldom used as a starting point for a reflection on the local practices. The tendency to favor some practices over others is often based on pre-existing representations rather than on concrete classroom experiences. In our interviews, many arguments point to the language problem though it is not the case in this classroom. Some local students did provide examples of knowledge learned from immigrants, but they concluded introducing a notion of conflict: they listen to their immigrant peers, they are interested in their practices, they even take responsibility for their level of understanding when helping them, but they do not contemplate the option of carrying on prolonged mathematical conversations with them or adopting their mathematical practices.

How do local students develop the perceptions they have? For example, they viewed working in groups with immigrant students as something that they needed to do to help them but did not seem to envision it as a learning opportunity for themselves. Further research should explore what factors may influence these perceptions. What role do teachers and parents play in this process? In Civil and Planas (2004), we have the case of a local student who refers to his father not really wanting him to work
with the immigrant students for fear that he may be wasting his time. How can teachers really promote and build on the diverse approaches to mathematics that students bring to class without creating this image of ours versus theirs, which seems to lead to situations of conflict in the learning environment?

References


