

HOW TO APPROACH NEGATIVE NUMBERS IN SCHOOL

Gildo Luís Bulafo

Pedagogical University, Beira Campus – Mozambique

At the Pedagogical University in Beira, teachers of mathematics for secondary schools are being trained since 1996 under BLEM Programme (*Bacharelato e Licenciatura em Ensino de Matemática*). In the programme, I am lecturer of Didactics of Mathematics and my main aims are: a) to discuss secondary school mathematics topics with prospective teachers and find best ways of teaching them; b) to provide prospective teachers with basic knowledge for scientific research in mathematics education.

The first topic that we studied in 1998 was *Negative Numbers* because it is the first topic of the syllabus for secondary schools (grades 8 – 10), and because "Negative numbers have intrigued and confused some of the greatest mathematicians who have ever lived" (Davis and Maher, 1993).

Firstly, the prospective teachers answered a questionnaire with simple addition and subtraction tasks in which they were asked to explain how to calculate and to explain how they would explain these tasks to pupils. They were asked to indicate, which everyday life situations they could use to explain the tasks. After that, the prospective teachers conducted interviews in secondary schools to verify how pupils work with negative numbers.

In the study we wanted to find out which specific problems the pupils in school have with negative numbers and identify their origins, in order to find an approach which may help pupils and teachers.

With this topic we found that prospective teachers had many difficulties in formulating questions which could help the pupils to reflect on their own words, ideas and solutions. There were some very positive examples, where the students succeeded in conducting an interesting dialogue with a pupil and making a good report of the discussions. During the activities we required that the students learned to analyze the ways of thinking of pupils. They became conscious that in teaching mathematics, teachers should teach in the direction of what pupils think instead of what the teachers think.

References

- Davis, Robert B. & Maher, Carolyn A.: 1993, 'The reality of negative numbers', in Robert B. Davis & Carolyn A. Maher (Eds.): *Schools, mathematics and the world of reality*, Allyn and Bacon, Boston – USA (p. 51 – 60).
- Nunes, Terezinha, 1993: 'Learning mathematics. Perspectives from everyday life', in Robert B. Davis & Carolyn A. Maher (Eds.): *Schools, mathematics and the world of reality*, Allyn and Bacon, Boston – USA (p. 61 – 78).