EVOLUTION OF STUDENTS' MATHEMATICAL PROCEDURES IN DIVISION TASKS

Fátima Mendes[*+], Joana Brocardo[*+]
[*]Escola Superior de Educação, Instituto Politécnico de Setúbal
[+]Unidade de Investigação do Instituto de Educação, Universidade de Lisboa

A key aspect of learning division is working both on multiplication and division facts, helping to develop students' awareness of the relations between these two operations (Anghileri, 2003). Some authors also argue that students do not find division much different from multiplication and that they are naturally able to adapt their multiplication procedures to the division contexts without much difficulty (Ambrose, Baek & Carpenter, 2003).

The aim of this research is to understand how the 23 students of one third grade class learn multiplication (and division), having as background the idea of hypothetical learning trajectories (Simon, 1995). The report's first author conducted the research in the context of a teaching experiment carried out, in the classroom, during eight months. The researcher together with the classroom teacher developed sequences of multiplication and division tasks, which were implemented by the teacher, in the classroom. To highlight the relationship between multiplication and division operations was one of the key ideas that supported the development of the hypothetical learning trajectory.

The data in the study includes field notes, transcript of videotaped classroom episodes and students' written work. A content analysis was used for data analysis.

The results reveal that students' use a diversity of procedures and relate their procedures with the tasks' characteristics. The results also stress the importance of relating multiplication and division to solve with success the division tasks. Finally, it was clear that some everyday life contexts help to develop appropriate division procedures, namely enhancing the use of arrays by the students.

References

Ambrose, R., Baek, J. M., & Carpenter, T. P. (2003). Children's invention of multidigit multiplication and division algorithms. In A. J. Baroody, & A. Dowker (Edits.), *The development of arithmetic concepts and skills* (pp. 305-336). Mahwah, NJ: Erlbaum.

Anghileri, J. (2003). Issues in teaching multiplication and division. In I. Thompson (Ed.), *Issues in teaching numeracy in primary schools* (pp. 184-194). Buckingham: Open University Press.

Simon, M. A. (1995). Reconstructing mathematics pedagogy from a constructivist perspective. *Journal for Research in Mathematics Education, 26(2)*, 114-145.

2013. In Lindmeier, A. M. & Heinze, A. (Eds.). *Proceedings of the 37th Conference of the International Group for the Psychology of Mathematics Education*, Vol. 5, p. 245. Kiel, Germany: PME.