

EXPLANATIONS BY MATHEMATICS TEACHERS: AN ANALYSIS

Mapula Ngoepe

University of South Africa

One of the fundamental role of the mathematics teacher is to provide learners with understandable explanations. 'Explanations are demonstrations of understanding and provide a window to a person's thinking' (Zuzovsky & Tamir, P.1101, 1999). Studies in explanatory frameworks reveal that they provide an avenue to enhance learners' understanding of scientific phenomenon. Regrettably, less has been written about the role of explanations in mathematics teaching and learning (Dagher and Cossman 1992, Horwood 1988, Martin 1970, in Treagust, 2000).

This paper presents an analysis of twenty-three lesson observations of 10 secondary mathematics teachers in three township schools. This is done with the aim of identifying, classifying and analyzing the spoken and written explanations of a sample of mathematics teachers. The analysis of results was guided by the framework of Curtis & Reigeluth (1984) and Ogborn et al. (1996). The findings revealed among other things that mathematics teachers explanations are influenced by various factors, that they often do not consider learners' prior knowledge, are incomplete and do not always lead to understanding. The findings will be used to guide professional development intervention programs to help teachers improve their mathematics instruction.

Reference:

- Curtis, R.V., & Reigeluth, C.M. (1984). The use of analogies in written text, *Instructional Science*, 13, 99-117.
- Ogborn, J., Kress, G., Martins, I., & McGillicuddy, K. (1996).*Explaining Science in the classroom*. Buckingham, Open University Press.
- Treagust, D.F. & Harrison, A.G. (2000). In search for explanatory frameworks: an analysis of Richard Feynman's lecture ' Atoms in motion', *International Journal of Science Education*, 22,11, 1157-1170.
- Zuzovsky, R. & Tamir, P. (1999). Growth patterns in students' ability to supply scientific explanations: findings from the Third International Mathematics and Science study in Israel. *International Journal of Science Education*, 21,10, 1101-1121.