

CHANGING STUDENTS' ATTITUDES TO MATHEMATICS THROUGH SMALL-GROUP COLLABORATION?

Susan Steward and Tony Pell, University of Cambridge, UK

In recent years there has been great interest in small-group learning in mathematics. From the range of studies in this area some have focused on the nature of different types of verbal interactions on achievement (eg. Webb, 1991); others have focused directly on insights from the discourse itself (eg. Pirie, 1991). Few studies have considered the effects of small-group work on students' attitudes to mathematics and their perceptions of how mathematics might be taught.

The authors have been engaged in a large four-year study investigating the effects of small-group work on student attitude, attainment and working practices in English, Mathematics and Science in the early secondary years (age 11 - 14). A recent review of this 'core' curriculum in England and Wales indicates that students enjoy group work but are given few opportunities to learn in this way. With regard to mathematics in particular, Nardi and Steward (2003) found that the perceived isolated nature of school-mathematics and limited opportunities for peer collaboration are factors in further alienating students from the subject.

At the beginning of the current academic year attitude questionnaires were administered to just over 1000 students in twenty different schools. Using 5 point Likert scale items, the questionnaire probed general attitudes to small-group work and to liking the core subjects. General results from this survey round show:

- declining attitudes towards mathematics during the early secondary years
- a significant gender difference in (not) liking mathematics (girls more negative)
- very positive attitudes towards group work in general

Our work in schools in the three subject areas also suggests that small-group work is less likely to be used in mathematics teaching compared to the other 'core' subjects. Within the twelve mathematics classes in the project, similarities and differences in 'pre-disposition to group-work' are evident. Individual student scores have also been calculated to highlight those who are very positive or very negative about group-work. The team intends to examine these more 'extreme' classes and pupils through observation and student interviews. At the end of this year the same questionnaire will be administered to examine whether there are significant shifts in students' attitudes towards learning style in mathematics.

Nardi, E. & Steward, S. (2003) 'Is Mathematics T.I.R.E.D.? A Profile of Quiet Disaffection in the Secondary Mathematics Classroom'. *British Educational Research Journal*, 29, pp. 345-367.

Webb, N. E. (1991), 'Task-related verbal interaction and mathematics learning in small groups'. *Journal for Research in Mathematics Education*, 22(5), 366-389

Pirie, S (1991) Peer discussion in the context of mathematics problem solving in Durkin & Shire (ed) 'Language in Mathematical Education'; Buckingham, Open University Press