

**Student and teacher perceptions of preparation in mathematics in
middle school and its impact on students' self-efficacy and
performance in an upper secondary school in Western Australia**

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Abstract

Middle school initiatives (including heterogeneous classes and an integrated, flexible curriculum together with promotion of student input) have been implemented in schools in Western Australia in response to a perceived need to align schools more closely with a more student-centred approach to learning, in the expectation of meeting more students' needs and thereby reducing student dissatisfaction and increasing the possibility of students pursuing life long learning. Specific goals underlying the initiative include the development of independent learning and student responsibility for learning through a series of strategies such as self-paced learning, student involvement in negotiating their own learning, and a strong emphasis on respecting and valuing student input into the implementation of curricula. However, owing to the way that the curricula for Middle and Upper secondary school mathematics are currently structured, problems might arise for students in the transition from "a relaxed to a highly discipline-based organization of content" (as described by Venville, Wallace, Rennie, Malone (1998). Students accustomed to the current approaches implemented in Middle schools (Years 8 to 10) may be disadvantaged in the transition to Upper secondary school courses (Years 11 and 12) compared with those students who have been exposed to a more discipline-based organization of content throughout early adolescence and prior to entry into courses leading to tertiary entrance (T.E.E. courses). The aim of this project was to investigate the possible effects of Middle school initiatives in a group of students from three Middle schools in Western Australia in one subject area – mathematics – on the perceptions of self-efficacy and preparation in mathematics once the students encounter Year 11 Upper school courses. A survey containing Likert-type rating scales pertinent to four areas of interest – Self-efficacy in mathematics; Self-Directed Regulation; Views on current teaching;

and Views on prior teaching were administered to students transferring from three “feeder” Middle schools to Year 11 (Upper secondary school) classes in one Senior College in Western Australia for each of 4 consecutive years. Students were also asked for their comments regarding preparation for the challenges of their chosen courses in mathematics. In addition, their levels of performance in a range of mathematical skills were assessed using a teacher-developed test. The perceptions of their Middle and Senior School teachers were also sought. As the survey was administered to all students as a routine part of action research within the mathematics faculty at the Senior College, only the results of those students who subsequently agreed to be participants in the study are reported in this dissertation. Results indicated that a mismatch existed in approaches and skills between Middle School and Senior College Mathematics. The reliance on students making suitable choices for themselves, the absence of specialist teachers of mathematics in middle schools, mixed ability classes in which specialist teachers of mathematics find it difficult to operate successfully and a curriculum that was so flexible that teachers omitted key elements required for later studies were the main factors that resulted in a significant number of students making the transition from middle to senior school with insufficient preparation. Implications for the teaching of mathematics in these three Middle schools and the Upper school are discussed.