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Affective Determinants of Additional Mathematics Achievement in Malaysian Technical Secondary Schools

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Abstract

The purpose of this study was to identify the affective determinants of additional mathematics achievement in technical secondary schools. In addition, this study also aimed to identify the best predictor of affective variables toward additional mathematics achievement. The respondents of the study were 250 students from three public technical secondary schools in Kedah, Malaysia that were selected using random sampling. 40 multiple-choice items were selected to measure and determine their level of additional mathematics achievement. The affective variables were based on attitude, anxiety and habit. Multiple regression were used for tests of significance. The findings of the study showed that attitude has a positive relationship whereas anxiety in learning Additional Mathematics has a negative relationship with additional mathematics achievement. Additionally, the findings showed that attitude was the best predictor of additional mathematics achievement. This finding proposed the importance of assessing students' affective attributes before assessing their cognitive ability in additional mathematics achievement. Therefore, this study suggests that teachers, counsellors and principals could assess students' affective attributes in identifying students' cognitive ability in learning additional mathematics.

Selection and peer-review under responsibility of Cognitive-counselling, research and conference services (c-crcs).

Keywords: Attitude, Anxiety, Habit, Additional Mathematics

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1. Introduction

Generally, students think that mathematics is difficult to master. Therefore, some students perform very well while some fail to master this subject even when they are facing the easy topics within the subject. Students have their own styles and approaches in understanding and processing mathematical information. Hence, several reasons have been given for this disparity in mathematics achievement. Among them is that individuals possess different, unique and personal orientation in mathematics (Berita Matematik,1993). It is noteworthy that despite its utility and importance, mathematics is perceived by most pupils as difficult, boring, not very practical, abstract, etc., and its learning as requiring a special ability that is not always within everyone's reach (Ignacio, Nieto & Barona, 2006).

The 60:40 policy of the Ministry of Education, Malaysia which targets 60 per cent of the students in the Science and Technology streams in upper secondary schools has still not been met. In 2004, there were only 43.18 per cent students in the Science and Technology streams. This shows that the students failed to master mathematics considering that a good grade in mathematics was a requirement for selection into the Science and Technology streams (Hashim Yaacob, 2004).

Studies on intellectual development and the nature of learning have resulted in various theories of learning. One of the important learning theories is the Theory of Cognitive Development of Children (Piaget, 1965). This theory differs and varies with changes in age, that is, the sensory motor stage (0-2 years), the pre-operational stage (2-6 years), the concrete operational stage (7-12 years) and the formal operational stage (after 12 years). In this study, emphasis was given to the last stage of cognitive development as the students involved were in the 16-year age group (Form Four) in secondary schools. Learning theories are descriptive in nature, that is, they analyse the mental activities that can be performed by students according to the intellectual development in certain subjects. Teachers who are aware of the child development theory can understand how students learn and solve mathematical problems. Skemp (1971) in his book *The Psychology of Learning Mathematics* conjectures "Problems of learning and teaching are psychological problems, and before we can make much improvement in the teaching of mathematics we need to know more about how it is learned"(pp. 14).

Basically learning is understood as an orientation which brings changes in each individual. After undergoing the learning orientation, a person will know, execute or think about something that he has not known before. Besides this, learning cannot be separated from the activities related to obtaining and using knowledge. When knowledge is obtained and used, then the expected changes will be realized (Wan Zah, 2000).

Polya (1973) mentions that four phases, namely understanding the problem, planning the problem planner, solving the problem and checking the answers, should be followed by the students to solve mathematical problems. These four phases are important to understand how to solve mathematical problems. The development of mathematics at the school level involved three main areas, namely Numbers, Shapes and Relationship. The development and foundation of mathematics start with the area of Numbers in the Integrated Curriculum for Primary Schools, (KBSR), while at the Integrated Curriculum for Secondary Schools (KBSM) level, the areas of Shapes and the Relationship are given more attention besides the area of Number at the upper secondary level. Many school students experience difficulty in learning because they are seldom taught how to study. The difficulty in learning among students is only slightly connected to natural ability (Lashley & Best, 2001). A student's views regarding learning influences the way the individual studies. However, views,