ABSTRACT. This paper examines differences in mathematics achievement among eighth-grade students using a secondary analysis of the data. The students, who are from Malaysia, had participated in the Trend International Mathematics and Science Study (TIMSS) 1999. A series of school, home, demographic and socio-economic variables were used to investigate the differences in the mean student mathematics scores. Evidence from the data shows that gender, the language spoken at home, expected educational level, family background, and home educational resources and aids have a significant influence on the students’ level of mathematics achievement.

KEY WORDS: correlation analysis, mathematics achievement, mean scores, student background, TIMSS

INTRODUCTION

The importance of having a solid background in mathematics and quantitative analysis as prerequisites for admission into university or college in most areas of study is well recognized. Students’ achievements in mathematics in high school have an influential effect on their performance in college. Mathematical and quantitative competencies are also linked to better chances of employability, higher wages, and higher on-the-job productivity once employed (Geary & Hamson, 2000). Thus, mathematics learning and students’ performance in mathematics receive considerable attention from teachers and parents. It is therefore important to identify and recognize the factors that could influence students’ mathematics achievement in order to help them improve and make substantial academic progress.

Achievement in mathematics varies across nations, regions, schools, and a variety of socio-economic and demographic characteristics. Studies on mathematics competency and its development are numerous and varied, focusing on the different methodologies and the various factors that might affect students’ achievement (Ghazali & Lim, 1996; Yates, 1999; Ma & Klinger, 2000; Papanastasiou, 2000; 2002; Wilkins & Ma, 2002; Kiamanesh, 2004). For example, Ghazali and Lim (1996) found that
there are cultural differences in both the headmaster and teachers’ preferences and choices for teaching mathematics between the different ethnic schools in Malaysia. According to Papanastasiou (2002), there is a positive relation between attitudes towards mathematics and mathematics achievement. Kiamanesh (2004) also found that self-concept, home background, teaching aids and attitude have a significant effect on mathematics achievement among Iranian students. Gender-related issues in mathematics learning and achievement is another area that has been widely researched (Gallagher & Kaufman, 2005; Cleary, 1992; Beller & Gafni (1996). While these studies found that females generally score lower than males on standardized test of mathematics, a study by Alkhateeb (2001) found that among high school students in the United Arab Emirates girls scored higher than boys on tests of mathematics achievement.

In Malaysia, the growing awareness of the importance of mathematics competency in secondary school for tertiary education and future careers has led to high expectations from both the teachers and parents for students to do well in mathematics examinations. Mathematics as a subject is taught in every tuition centre across all levels of schooling outside of the school hours, with a growing number of parents who engage teachers for the personal tutoring of their children at home. There is also concern about the issue of disparity in mathematics achievement between the different subgroups of the population, as well as ways of improving students’ overall performance and narrowing students’ achievement gaps. It is the purpose of this paper to examine the differences in students’ achievement in secondary school mathematics across a variety of characteristics pertaining to the students and their family background, including gender, the language spoken at home, students’ expectation for finishing school, the education of parents, and the possession of educational aids.

**Methods**

This study is a secondary analysis related to the Trend in International Mathematics and Science Study (TIMSS) conducted in 1999 by the International Association for the Evaluation of Educational Achievement, with a permanent secretariat based in Amsterdam. The original study was designed to provide trends in eighth-grade mathematics and science achievement in an international context involving the participation of 38 countries, including Malaysia. This paper uses data drawn from TIMSS