

**MATHEMATICS LEARNING STRATEGY AND MATHEMATICS
ACHIVEMENT AMONG MIDDLE SCHOOL STUDENTS IN THE
NORTH OF JORDAN**

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Abstrak

Kajian *Trends in International Mathematics and Science Study* (TIMSS) pada tahun 1999, 2003, 2007 dan 2011 menunjukkan pelajar gred 8 dari Jordan memperoleh pencapaian yang rendah dalam matematik. Hal ini adalah berkaitan dengan banyak faktor termasuk faktor Strategi Pembelajaran Matematik (MLS). Sehingga kini tidak banyak kajian yang dijalankan berkaitan dengan MLS dan pencapaian matematik dalam kalangan gred 8 dari Jordan. Kajian ini bertujuan untuk mengenal pasti perbezaan jantina berdasarkan nombor, algebra, geometri, pencapaian matematik dan visualisasi ruang, dan sejauhmana faktor MLS pelajar iaitu sikap, motivasi, regulasi sendiri, konsep sendiri dan kebimbangan matematik menyumbang kepada pencapaian matematik. Kajian ini juga menentukan sama ada visualisasi ruang menjadi perantara antara MLS dan pencapaian matematik. Responden kajian ini, yang terdiri daripada 360 pelajar gred 8 lapan sekolah menengah harian daerah Alkoura di Utara Jordan, dipilih secara pensampelan rawak berstrata. Kajian ini menggunakan 65 item untuk mengakses MLS. Ujian matematik mengandungi 30 item manakala ujian visualisasi ruang mengandungi 32 item. Dapatan kajian menunjukkan pelajar perempuan memperoleh skor yang lebih tinggi dalam nombor, algebra dan ujian matematik tetapi tidak terdapat perbezaan jantina dalam skor geometri. Pelajar lelaki menunjukkan pencapaian yang lebih baik berbanding dengan pelajar perempuan dalam visualisasi ruang. Keputusan kajian juga menunjukkan bahawa sikap matematik, motivasi, regulasi sendiri dan keberkesanan sendiri menyumbang kepada pencapaian matematik kecuali kebimbangan matematik. Visualisasi ruang menjadi perantara pencapaian matematik dengan sikap, motivasi dan kebimbangan matematik. Kajian ini menyumbang kepada pengetahuan dan teori kognitif sosial berkaitan dengan domain afektif pelajar berdasarkan faktor MLS dan visualisasi ruang yang penting sebagai pengetahuan asas bagi pembelajaran matematik. Pendidik matematik di Jordan perlu mengambil kira faktor MLS apabila mengajar matematik kepada pelajar gred 8 bagi membantu meningkatkan pencapaian matematik mereka.

Kata kunci: Nombor, Algebra, Geometri, visualisasi *spatial*, Strategi Pembelajaran Matematik.

Abstract

The results of 1999, 2003, 2007 and 2011 Trends in International Mathematics and Science Study (TIMSS) showed that Jordanian 8th grade students' achievement in mathematics is low. Mathematics Learning Strategy (MLS) has been identified as one of the attributing factors. To date, there is little study on MLS and mathematics achievement among Jordanian 8th grade students. The study aimed to identify the level of differences between genders based on number, algebra, geometry, mathematics achievement and spatial visualization, and to what extent would the student's MLS factors such as attitude, motivation, self-regulation, self-efficacy and mathematics anxiety contribute to mathematics achievement. Additionally, the study aimed to determine whether spatial visualization mediates between the MLS factors and mathematics achievement. The respondents in this study, who comprised of 360 students, were selected through stratified random sampling, from eight public middle schools in Alkoura District in the North of Jordan. The study used 65 items to assess the MLS. The mathematics test contains 30 items (number, algebra & geometry) while the spatial visualization test contains 32 items. The findings showed that female students scored higher than male students in numbers, algebra, and mathematics test but there are no gender differences in geometry scores. Male students performed better than their female counterparts in spatial visualization. The results also showed that mathematics attitude, motivation, self-regulation and self-efficacy contributed to mathematics achievement except mathematics anxiety. Spatial visualization plays a mediating effect between mathematics achievement and attitude, motivation, and mathematics anxiety. This study contributes to knowledge and social cognitive theory about the students' affective domain base on MLS factors and spatial visualization which is important as prerequisite knowledge for learning mathematics. Mathematics educators in Jordan need to consider the MLS factors when teaching mathematics to 8th grade students to help improve their mathematics achievement.

Keywords: Numbers, Algebra, Geometry, Spatial visualization, Mathematics Learning Strategy.

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List of Abbreviations

MoE	Ministry of Education
NCTM	National Council of Teacher of Mathematics
TIMSS	Trends in International Mathematics and Science Study
UNRWA	United Nation Relief and Work Agency
CTT	Classical Test Theory
SPSS	Statistical Package for the Social Sciences

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The educational system is primarily viewed as a significant factor forming the basis of an individual's development and progress, which forms the core of countries' development. As such, more and more focus is being emphasized on the educational systems promotion on a global scale. In the context of Jordan, the government has made considerable efforts in developing its educational system. Such system has experienced tremendous development and increasing progress that date back to the 1920s (Al-Jaraideh, 2009). In addition, Jordan undertook the responsibility of the development of an extensive and high-quality system for its citizens' development. As a result, citizens residing in poor and remote areas have had access to schools and education (Al-Jaraideh, 2009). The country's position in favoring basic education over higher education has improved the literacy levels and facilitated the achievement of higher degrees of enrollment. Primary education in Jordan, while freely provided, is not compulsory and it comprises of ten classes from first to tenth class.

Study curricula all over the world, including Jordan, have witnessed a radical change – changes in curricula and courses of all education levels. Specifically, in the last two decades, mathematics curriculum has undergone a lot of development on both the international and local level. On the international arena, more developed countries have begun a comprehensive review of the mathematical teaching program to develop and make them up-to-date to keep abreast of the needs of the 21st century.

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