

Secondary Students' Attitude towards Mathematics in a Selected School of Maldives

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Abstract

Students' attitude towards mathematics has been a factor that is known to influence students' achievement in mathematics. The purpose of this study is to find out the students attitude towards mathematics and find out gender difference in attitude towards mathematics in a selected school of Maldives. A total of 200 secondary students were administered with a questionnaire to find out their attitudes towards mathematics. The students answered questions regarding their personal confidence to mathematics and perceived usefulness of mathematics. The results show that the students' positive attitude towards mathematics is medium and there is no gender difference in their attitudes.

Introduction

The knowledge of mathematics is an essential tool in our society (Baroody, 1987). It is a tool that can be used in our daily life to overcome the difficulties faced (Bishop, 1996). Due to this mathematics has been considered as one of the most important core subject in a school curriculum. More mathematics lessons are likely to be taught in schools and colleges throughout the world than any other subject (A. Orton, D. Orton, & Frobisher, 2004). However, the standard tests and evaluations reveal that students do not perform to the expected level. The student under achievement in mathematics is not just a concern for particular countries, but has become a global concern over the years (Pisa, 2003). Mathematics performances of Maldivian students have been very low throughout. According to Ministry of Education of Maldives, only 28.4% of students who have participated in GCE O'level Cambridge examination in 2007 have passed above "C" grade. The results of 2008 also showed similar kind of trend where 66.8% of students getting grades below the expected level (Ministry of Education, 2011). These alarming results divert the attention of researcher to find out the reasons for the low performance of Maldivian students in mathematics. However, Maldives do not have any research conducted on this area suggesting reasons for low performance of the students.

Several studies and researches have been done in many countries to find the factors that influence the students' performance in mathematics. Among these factors, students' attitude towards mathematics is one important factor that has been consistently studied. Often, the studies on relationship between students' attitude and the students' academic performance show a positive relationship (Mohd, Mahmood, & Ismail, 2011; Bramlett & Herron, 2009; Nicolaidou & Philippou, 2003; Papanastasiou, 2000; Ma & Kishor, 1997). Hence students' attitude towards mathematics is a major factor that might influence the performance of the students. Due to this several studies has been conducted in different countries in order to find out the students attitude towards mathematics (Tahar, Ismail, Zamani & Adnan, 2010; Tezer & Karasel, 2010; Maat & Zakaria, 2010; Bramlett & Herron, 2009; Köğce, Yıldız, Aydın, & Altındağ, 2009; Tapia & Marsh, 2004; Fennema & Sherman, 1976) and hence to use these data to suggest the low performance of students and factors affecting it. The aim of this research is to find out the secondary students' attitude towards mathematics in a selected school of Maldives. The research will focuses on finding the students' attitude towards mathematics and also finding the significant difference between students' attitude towards mathematics with regard to gender of the students.

Literature Review

Attitude is a central part of human identity. Everyday people love, hate, like, dislike, favour, oppose, agree, disagree, argue, persuade etc. All these are evaluative responses to an object. Hence attitudes can be defined as 'a summary evaluation of an object of thought' (Bohner & Wänke, 2002).

They are inclinations and predispositions that guide an individual's behaviour (Rubinstein, 1986) and persuade to an action that can be evaluated as either positive or negative (Fishbein & Ajzen, 1975). Attitudes develop and change with time (Rubinstein, 1986). According to Multicomponent model of Attitude (Eagly & Chaiken, 1993), attitudes are influenced by three components. They are cognitive (beliefs, thoughts, attributes), affective (feelings, emotions) and behavioural information (past events, experiences) (G. Maio, G. R. Maio, & Haddock, 2010). When reviewing literature on students' attitude towards mathematics, it reveals that several factors play a vital role in influencing student's attitude. These factors can be categorised into three distinctive groups. Firstly, factors associated with the students themselves. Some of these factors include student's mathematical achievement score (Köğçe et al, 2009), anxiety towards mathematics, student's self efficacy and self concept, extrinsic motivation (Tahar et al, 2010) and experiences at high school (Klein, 2004; Bobis & Cusworth, 1994). Secondly, the factors that are associated with the school, teacher and teaching. Some of these factors that influence attitudes are teaching materials used by teacher, teachers' classroom management, teachers' content knowledge and personality, teaching topics with real life enriched examples, other student's opinions about mathematics courses (Yilmaz, Altun & Olkun, 2010), teaching methods, reinforcement (Papanastasiou, 2000), receiving private tuition (Köğçe et al, 2009), teachers' beliefs towards mathematics (Cater & Norwood, 1997) and teachers' attitude toward mathematics (Ford, 1994, Karp, 1991).

Thirdly, factors from the home environment and society also affect students' attitude towards mathematics. Factors such as educational background of parents, occupation of parents (Köğçe et al, 2009) and parental expectations (Tobias, 1993) play a crucial role in influencing students' attitude towards mathematics. Due to these several factors students have different attitude towards mathematics. More often, the public image of mathematics is labeling it as a difficult, cold, abstract, theoretical and ultra rational subject (Ernest, 2004). However, some studies show that students have a relatively positive attitude towards mathematics (Tezer & Karasel, 2010; Yilmaz et al, 2010; Fan, Quek, Yan, Mei, Lionel & Yee, 2005). Sometimes, Mathematics is also considered as very important and largely masculine subject (Ernest, 2004). Several studies gives evidence that compared to boys, girls lack confidence in doing mathematical sums and viewed mathematics as a male domain (Meelissen & Luyten, 2008; Odell & Schumacher, 1998; Hyde, Fennema, Ryan, Frost, & Hopp, 1990).

However there are many studies that suggest that there is no significant difference between attitude towards mathematics among male and female students (Mohd et al, 2011; Köğçe et al, 2009; Nicolaidou & Philippou, 2003). And there are some other studies which suggest that the attitude of the participants of their study towards mathematics was more positive in the third year than the first year (Grootenber & Lowrie, 2002) and there is a difference between attitude in the grades 6, 7 and 8 (Köğçe et al, 2009). Hence it can be said that students' attitude towards mathematics are very subjective and varies among the students. Several studies had been conducted to find out the relationship between attitude towards mathematics and academic achievement of the students. Most of these studies showed that there is a positive correlation between students attitude towards mathematics and academic achievement of students (Mohd et al, 2011; Bramlett & Herron, 2009; Papanastasiou, 2000; Ma & Kishor, 1997) and also achievement in problem solving (Nicolaidou & Philippou, 2003), The studies has also shown that students attitude towards problem solving in terms of patience, confidence and willingness has a positive relation with students' mathematics achievement (Mohd et al, 2011).

Methodology

This is a quantitative study which explores secondary students' attitude towards mathematics in a selected secondary school of Maldives. Population under consideration is the secondary school students of an island in southern part of Maldives. The school has a population of 395 secondary students. A sample size of 195 students was determined using a sample size calculator from internet (www.surveysystem.com). The confidence level and confidence interval of sample size calculator was set at 95% and 5 respectively. However, for the survey 200 students were chosen from grade 9 and 10. To collect quantitative data, a survey was conducted. According to Grazino & Raulin (2000), survey method is often used to study people's feeling and thinking about specific issues. Attitudes cannot be directly observed, so to measure attitudes one can simply ask the person or use indirect methods of inferring cues to measure implicit attitudes. Usually, direct methods are used in both academic and applied research (Bohner & Wänke, 2002). Throughout the years several attitude scales have been developed and used to measure attitude. The scale used in this study is, one of the most popular scales used over the past three decades, Fennema-Sherman Mathematics attitude scale (Tapia & Marsh, 2004, Kloosterman & Stage, 1992). The Fennema-Sherman Mathematics Attitude Scales (1976) were developed in 1976, with a group of nine instruments to measure attitude towards mathematics.

However for the convenience of this study two instruments were used. They are personal confidence of the students to do mathematics and usefulness of mathematics as perceived by the students. The questionnaire used is adapted from “A Modified Fennema-Sherman Mathematics Attitude scale” (Dopken, Lawsky & Padwa, n.d.). The response rate from the respondents was 100% and the data collected were analyzed using Statistical Package for Social Science (SPSS). To find significance difference between gender and attitude towards mathematics a t-test was conducted.

Results and Discussion

This section is divided into three parts, demographic characteristics, students’ attitude towards mathematics and attitude towards mathematics based on gender.

Demographic characteristics

Table 1 represents the demographic back ground of the students according to their gender. The number of students participated in this study is 200, of which 95 are male students and 105 are female students.

Table 1. Demographic Characteristics according to gender

Gender	N	%
Male	95	47.5
Female	105	52.5
Total	200.0	100.0

Attitude towards Mathematics

The questionnaire was analyzed to find out the students attitude towards mathematics (personal confidence of students and perceived usefulness of mathematics). Table 2 shows the criteria used to categorize these variables as low, medium and high, based on the range of scores given by Jamil (2001) as cited by Mohd et al (2011).

Table 2. Level of Variables

Mean Score	Level
1.00 - 2.33	Low
2.34 - 3.66	Medium
3.67 - 5.00	High

Table 3 show that the personal confidence of mathematics, perceived usefulness of mathematics and overall attitude towards mathematics is medium.

Table 3. Mean and Standard deviation of the variables

Variables	Mean	Standard Deviation	Level
Personal Confidence	3.36	0.17	Medium
Usefulness of Mathematics	3.64	0.18	Medium
Overall Positive Attitude towards Mathematics	3.51	0.18	Medium

Attitude towards Mathematics based on gender

Table 4 shows that there is no statistically significant difference between the students’ attitude towards mathematics between male ($M=3.4302$, $SD = 0.5596$) and female ($M= 3.5512$, $SD = 0.6316$), where $t(198) = 1.438$, $p = .152$, $\alpha = .05$. Hence the attitude towards mathematics among male and female student are equal. This was supported by the similar studies done by Mohd et al (2011), Köğçe et al (2009) and Nicolaidou & Philippou (2003).

Table 4. Result of two – tailed t - test between students’ attitude towards mathematics and male (n=95) and female (n=105)

	Mean		Std. Deviation		t	df	p
	Male	Female	Male	Female			
Overall attitude towards mathematics	3.4302	3.5521	0.5596	0.6316	1.438	198	0.152

Conclusion and recommendations

As a conclusion to this research it can be said that, since the students' positive attitude towards mathematics is at medium level, it shows that there are still possible room for improvement. However, it is interesting to know that despite the lower performance of Maldivian students in mathematics, the attitude of the respondents of this study is fairly positive. The research also shows that the students' attitude towards mathematics do not have significant difference between male and female students. Hence there is no gender gap in attitudes. It is highly recommended that the maximum effort should be given to improve the students' attitude towards mathematics and conduct further studies to find factors influencing students' attitude towards mathematics. Moreover studies could be conducted to find if there is a relationship between students' attitude and performance of students in the schools of Maldives.

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