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Attitude of Students towards Learning Mathematics at Elementary Level

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Abstract

Mathematics is an important subject in general education. Mathematics develops students' analytical thinking and problem-solving skills. Children are sent to school in order to become useful members of a society and contribute to the welfare of society. Mathematics learning leads to the attainment of this objective. Mathematics attitude is essential for its learning. The main objective of this study was to identify students' attitude towards mathematics at the elementary level. The population of the present study consisted of all the public and private elementary schools of city Lahore. A sample of 300 students was selected through convenient sampling technique. A Questionnaire was used as a tool for data collection. Descriptive and inferential statistics were used to analyse the data. Results of descriptive statistics showed that most of the students did not feel easy while they are in the mathematics classroom. They did not think that mathematics is beneficial for their practical life. They think that they were good in other things as compare to mathematics, but they felt good if mathematics problems led them to think out of the box. Results of independent sample t-test indicated that male and female students have the same attitude towards Mathematics. It is suggested that for mathematics learning, teachers should develop students' attitude toward mathematics by controlling the factors that lead students' negative view and emotions for the subject.

Keywords: Students' attitude, mathematics learning, elementary level

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Introduction

Generally, mathematics is considered as an important and beneficial subject in general education. Although it is an important subject it is not much popular in students because it is different from other subjects. Previous results show that at different levels students are not performing well in mathematics which shows that they are not giving much importance to the subject. There can be a number of factors that can affect students' mathematics performance and students' attitude towards mathematics is one of those. In the early 1960s educationists considered the attitude of someone towards something or some subject as essential for its learning. Most of the teachers believed that attitude is a vital aspect of students' learning and achievement in mathematics. Many research studies have found a positive correlation between students' attitude towards mathematics and their achievement in mathematics (Mohd et al, 2011; Bramlett & Herron, 2009; Papanastasiou, 2000; Ma & Kishor, 1997; Nicolaidou & Philippou, 2003).

There is a controversy in defining the term attitude in mathematics. Usually, it is believed that both types of attitude (negative or positive) have a nature of emotional relation to a subject (McLeod, 1994).Experts have used different instruments to find students' attitude towards mathematics (Leder, 1985).According to Ma and Kishor (1997) attitude towards mathematics is reflected through "an aggregated measure of a liking or disliking of mathematics, a tendency to engage in or avoid mathematical activities, a belief that one is good or bad at mathematics, and a belief that mathematics is useful or useless". The attitude of students towards mathematics is important to get success in the subject of mathematics by increasing their rate of participation in learning mathematics (Farooq & Shah, 2008).

A study conducted to know the attitude towards mathematics reported that one-third of students did not illustrate any attention towards learning mathematics (Olson, 1998). Instead of taking interest in it, they had a great fear of it. Moreover, students' anxiety in learning mathematics has also been attracted researchers to study on their attitude towards mathematics (Akhter & Akhter, 2018). Results of the research have shown that some characteristics of mathematics, e.g. precision, logic and skill of problem-solving develop anxiety among certain students (Richardson & Woolfolk, 1980), and may have a negative effect of nervousness on the learning of mathematics (Richardson & Suinn, 1972).

Current research indicated that the following factors can affect the attitude towards learning mathematics:

- Personal or individualized factor
- Environmental factor

Most students believe that their success in mathematics depends upon different factors, e.g, their luck, easiness of content. They don't believe in their ability, hard work, persistence and positive attitude towards mathematics as a key to success. Rather they believe that their understanding and positive attitude towards mathematics cannot play any vital role in their mathematics achievement (Krishnan, 2018).

It is difficult to understand the language of mathematics which may cause a negative attitude towards learning Mathematics. Memorizing the mathematical terms without meaning and context is not productive. The terms which have distinct mathematical meaning like "volume," "yard," "power" and "area" make students confused. As compared to humanities, the terminology of mathematics is difficult and unique. Ashby (2009) argued that communication is problematic than the procedure of mathematics. Distinctive language, symbolization and complex syntax of mathematics create hurdles in the way of students' learning. There are many misconceptions and beliefs of students about the language of mathematics. Mostly students consider learning mathematics just as memorization of rules and formulas.

Not only students' misconceptions and beliefs about mathematics as a difficult subject created their negative attitude towards mathematics but common and repetitive failures of students in mathematics may develop a negative attitude towards it. A study investigated that within a time when students reach high schools their attitude regarding mathematics becomes negative. While at the time of students' first communication with the school their attitude was positive towards learning mathematics. Results of different studies consistently exposed that learners' attitude towards mathematics is positively correlated with their academic performance in mathematics. Students with positive attitude perform well and achieve high grades in the subject of mathematics (Sanchez & ZImmerman, 2004).

Mathematics is an important subject which enables a person to lead a successful social and personal life. Children are sent to school in order to make them a useful member of the society and who can promote the wellbeing of their society and country. Pakistani schools (especially government schools) are producing disappointingly low levels of learning outcomes in mathematics and science. This shows the major and deep-rooted challenge to Pakistan's economic growth. This was publicized by a report launched by Pakistan Alliance for Mathematics and Science in collaboration with Alif Ailan. In Punjab, from 2012 to 2016, results of Punjab Education Commission (PEC) showed that average mathematics scores of Class V were 46.13%, and average mathematics scores of class VIII were 53.1%. It is alarming that in class five students scored less than fifty percent and in class eight hardly obtained fifty percent scores. It shows that on the whole most of the students did not know mathematics. As discussed

above, students' positive Attitude towards mathematics is an important element to get success in the subject (Farooq & Shah, 2008). Keeping in view the review of the related literature, this research was conducted to know the attitude of elementary school students towards learning mathematics, and the reasons behind the problem through which the students do not perform well in mathematics (Kanafiah & Jumadi, 2013).

Objectives of the Study

Following objectives were established to conduct this study:

- To identify the students' attitude towards learning mathematics at the elementary level.
- To identify the difference in students' attitude towards learning mathematics at the elementary level on the basis of gender.

Research Questions

This study answered the following research questions.

- What is the attitude of students towards learning mathematics at the elementary level?
- What is the difference in students' attitude towards learning mathematics at the elementary level on the basis of gender?

Research Methodology

Quantitative approach and descriptive research design were used to conduct this study. The population of the present study consisted of all public and private elementary schools of Lahore city. The target population was divided in 5 public and private elementary schools and based on the students of these schools. The sample population for this study was the students of 6^{th} to 8^{th} class. A sample of 300 students was selected by using convenient sampling technique. A survey was conducted by using a questionnaire to elicit the responses of students about their attitude towards learning mathematics at the elementary level. Each item was rated on a five point likert type scale from strongly agree "5" to strongly disagree "1". After collecting the data were analysed. Descriptive statistics were used to calculate the frequency and percentage of responses of the respondents. Independent sample t-test was applied to find out the difference between the responses of male and female students for their attitude towards learning mathematics at elementary school levels.

Results

Following section is presenting frequency tables of students' responses for the statements to know their attitude towards learning mathematics, the mean and standard deviation of students' responses and results of independent sample t-test to know the difference in students' attitude towards learning mathematics.

Table 1
When I am in Mathematics Class, I Usually Feel at Ease and Relaxed.

	f	%
Strongly agree	12	4.0
Agree	69	23.0
Neutral	33	11.0
Disagree	96	32.0
Strongly disagree	90	30.0
Total	300	100.0

Majority of students i.e. sixty two present responded that they do not feel easy and relaxed while they are in mathematics class. It shows a tendency of negative attitude towards learning mathematics. It is also evident that there are many students who do feel easy in the mathematics classroom, which shows their positive attitude.

Table 2
I Shall Need Mathematics for my Future Work.

	f	%
Strongly agree	6	2.0
Agree	3	1.0
Neutral	45	15.0
Disagree	69	23.0
Strongly disagree	177	59.0
Total	300	100.0

Results of table 2 show that the majority of students, eighty two percent, responded that they think that mathematics will not be needed for work in future. It reflects their negative attitude towards learning mathematics. Results also show that some students are sure about the use of mathematics in future and have a positive attitude towards learning mathematics.

Table 3
Learning Mathematics is a Waste of Time.

	f	%
Strongly agree	219	73.0
Agree	18	6.0
Neutral	12	4.0
Disagree	30	10.0
Strongly disagree	21	7.0
Total	300	100.0

Table 3 presents the results of students' responses to know what they feel about utilizing their time on learning mathematics. It is evident that the majority of students i.e. seventy nine percent responded that learning mathematics is a wastage of time which shows their negative attitude towards mathematics.

Table 4
Compared to Other Subjects, I Become Very Much Worried about How Well I am Doing in Mathematics

	F	*%*
Strongly agree	93	31.0
Agree	87	29.0
Neutral	24	8.0
Disagree	66	22.0
Strongly disagree	30	10.0
Total	300	100.0

Table 4 shows that the majority of students i.e. sixty percent responded that they become worried about their Mathematics performance as compared to other subjects.

Table 5
I Get Good Grades in Mathematics.

	f	*%*
Strongly agree	33	11.0
Agree	12	4.0
Neutral	3	1.0
Disagree	147	49.0
Strongly disagree	105	35.0
Total	300	100.0

Table 5 presented that the majority of students (eighty four percent) responded that they do not get good grades in mathematics. Grades may be considered as one of the indicators of students' attitude. In this perspective, it may be concluded that their attitude is not positive towards learning mathematics.

Table 6
I Like it When Mathematics Problems Make me Think "out of the box".

	f	*%*
Strongly agree	150	50
Agree	66	22
Neutral	42	14.0
Disagree	39	13.0
Strongly disagree	3	1
Total	300	100.0

Table 6 shows that almost seventy two percent students responded that they like it when Mathematics problems make them think "outside of the box".

Table 7
I Think I am Goodat Many Things, but I am not Good at Mathematics.

	f	*%*
Strongly agree	102	34.0
Agree	24	8.0
Neutral	45	15.0
Disagree	114	38.0
Strongly disagree	15	5.0
Total	300	100.0

Table 7 depicts that only forty three percent students responded that they are good at Mathematics. It could be assessed that most of the students do not think that they are good in Mathematics which shows their negative attitude in mathematics.

Table 8
I like to Solve Mathematics Problems at Home with Care and Interest.

	f	*%*
Strongly agree	3	1.0
Agree	27	9.0
Neutral	18	6.0
Disagree	87	29.0
Strongly disagree	165	55.0
Total	300	100.0

It is evident by the values of table 8 that majority of students i.e. eighty four percent responded that they do care to solve mathematics problems carefully and interestingly at home, which shows that there are few students who have positive attitude towards mathematics.

Table 9
The Mathematics I Learn in School is thought Provoking.

	f	*%*
Strongly agree	45	15.0
Agree	39	13.0
Neutral	12	4.0
Disagree	72	24.0
Strongly disagree	132	44.0
Total	300	100.0

Table 9 shows that sixty eight percent students responded that mathematics they learn in school is thought provoking, whereas only 28 percent consider mathematics as a thought provoking subject. Therefore, majority of the students have negative attitude towards mathematics.

Table 10
Descriptive Statistics

	Statements	*M*	*SD*
1.	When I am in Mathematics I usually feel at ease and relaxed.	2.33	1.12
2.	I shall need mathematics for my future work.	2.34	1.15
3.	Learning mathematics is a waste of time.	3.70	1.13
4.	Compared to other subjects, I become very much worried about how well I am doing in Mathematics.	2.35	1.7
5.	I get good grades in Mathematics.	2.33	1.5
6.	I like it when Mathematics problems make me think "outside of the box"	3.34	1.2
7.	I think I am good at many things, but I am not good at Mathematics.	3.37	2.2
8.	I like to solve Mathematics problems at home with care and interest	2.33	1.12
9.	The Mathematics I learn in school is thought provoking.	2.31	1.3

The above table shows the mean and standard deviation scores for all the statements. It depicts that majority of the participants agreed positively with all statements regarding learning mathematics.

Table 11
Independent Sample T-test to Identify Difference in Responses of Male and Female Students for their Attitude for Learning Mathematics

Variable		N	*df.*	*t*-value	*p*
Male	12.45	143	299	.031	1.88
Female	12.68	157			

Table 11 shows the difference in perceptions of male and female students about learning mathematics. The decision was based on p-value. The results of t-test was not significant *t(299)*= .031, *p=1.88.* The mean scores for the male 12.45 and female 12.68 were almost the same. Therefore, it is concluded that male and female students have the same attitude towards learning.

Discussion

This study was conducted to know the attitude of elementary school students towards learning mathematics. Results of the study revealed that most of the students have a negative attitude towards learning mathematics because they think it is a waste of time. These findings are supported by another study conducted to know the perceptions of students about learning mathematics (Setapa, Mustaphal, Kanafiah, & Zaman, 2016).

However, the results of some researches contradicted with the results of the present study (Akhter & Akhter, 2018; Kanafiah, & Jumadi, 2013, Daher, 2009). According to the findings of these studies, the students find mathematics as an interesting subject and excited in learning mathematics. Results of the current study further revealed that the male and female students have the same attitude towards learning mathematics at elementary level.

Punjab Education Commission (PEC) result shows students' poor performance at the primary and secondary level. According to Farooq and Shah (2008), students' attitude towards mathematics is important to get success in the subject. In light of the results of this study, it can be determined that one of the factors of students' low performance is their lack of positive attitude towards mathematics. Results are consistent with the results of other studies which find out that attitude of elementary school students towards learning mathematics was a cause of students' poor performance in mathematics (Kanafiah & Jumadi, 2013).

There is a dire need to take some practical measures to develop a positive attitude towards mathematics. For example, the curriculum should be updated according to the changing demands of the society and learners it may change their attitude towards mathematics. Concepts of mathematics included in the curriculum can be linked with the content in which students have become more expert and experienced. Teachers should employ different strategies according to the cognitive level of students and demands of mathematics skills needed in their practical life. Repetition of a teaching method may confine the opportunities of students learning and their ability to solve a problem. There may be many other reasons for students' poor performance in mathematics such as a subject matter of mathematics, frequency of absence from schools and lack of practice. One of the reasons may be deviation in the nature of a mathematics concept and strategies used by teachers to teach the concept.

Conclusion

Major findings of research determined that majority of the students have a tendency of negative attitude towards mathematics. Though there are many students who have positive attitude towards mathematics, but they are less in number. It is also evident that male and female students have the same attitude towards learning mathematics. Results depicted that most students think that learning mathematics is a waste of time, it scares them to think that they will be taking advanced high school mathematics, memorization of formulas is the best way to do well in mathematics while male and female did not have different opinion about liking mathematics, most of the students think that they are good at many things, but not good at mathematics. It is also found that when students are taking mathematics tests, they usually feel very nervous and uneasy.

Recommendations

It is recommended that:

- To develop a positive attitude towards mathematics teacher should create a comfortable classroom environment in which students may feel easy.
- Teachers should utilize brainstorming activities which may develop problem-solving skills to make them able to overcome the negative attitude towards mathematics.
- Teachers should make students aware of the application and usefulness of mathematical concepts in their practical life.
- Teachers should teach mathematics without the pressure of examination which creates anxious feelings among students.
- Teachers should chunk mathematical material into smaller steps, building of skills and scaffold concepts carefully, in this way students can practice each step and concept taught by teacher easily.
- Schools should give opportunities to students to perform essential activities regarding mathematical concepts to make them master and fluent in computational skills.

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