

# Factors Affecting Students' Attitude to Wards Mathematics in Lower Grade and High Level of Education

Genet Mekonnen Assefa (Msc)

Debank University College of Natural and Computational Sciences, Department of Mathematics

## Abstract

Mathematics is an indispensable subject of school curriculum and is important in daily living as well as in the study of other subjects. However, there is a common belief that majority of the students dislike mathematics, owing to an array of factors related to instruction and learners' cognitive, affective and psycho-motor attributes, subject matter and the learning environment. This paper elaborates on the affective factors influencing learning of school mathematics as perceived by the learners and it will reduce the factor among the university and lower grade schools. A questionnaire survey will be conducted on a random sample of schools around semen Gonder in Debank, wekn, Dabate, and also for high level education university around Amhara Region. Students' attitude towards mathematics is also affected by factors such as parental influences, teacher affective support and classroom instruction. The purpose of this research will also to examine the inter-relationships between these factors and effects on attitude towards mathematics

**Keywords:** Difficulties in mathematics, affective factors, attitude, students, high level education.

## Chapter 1 Introduction

### 1.1 Background of the study

Mathematics is a unique subject and it is a fundamental part of school curriculum. It is a instrument for the development of all other sciences. Knowingly or unknowingly, we are using mathematics in every facets of life. However, majority of students across the world dislike mathematics. Scarpello (2007) reports that seventy-five percent of Americans stop the study of mathematics and stay away from many careers that related to mathematics. He identifies mathematics anxiety as one of the main reason for this.

Learning is influenced by many factors, which can be cognitive or affective. Here, we are concentrating on affective side. Hart (1989) defined attitude towards mathematics as a complex of negative or positive emotions that associated with mathematics, individual beliefs towards mathematics and their behavior associated with mathematics.

Mathematics, to most, is a complex and difficult subject. The tendency for most students is to consider the subject as one that is boring, thus, creating lack of interest in the topics being discussed. This poses a great challenge for teachers and educators, especially in the primary and intermediate levels, wherein a good study habit and a firm grasp of basic concepts should be developed. Research indicates that computer technology can help support learning, and that it is especially useful in developing the higher order skills of critical thinking, analysis, and scientific inquiry.

### 1.2 Statement of the problem

Students' attitude towards math course is mainly measured by attitude scales and it shows whether they have positive or negative attitudes. In order to explore what kinds of factors affect attitude, qualitative research method is needed. Therefore this study is intended identify the factors that affect students attitude towards mathematics in lower grade students and high level of education students.

### 1.3 Need and significance of the study

Mathematics is a subject that causes many negative emotions. One of the main challenges to mathematics teacher is to make a positive attitude in students toward learning mathematics. Therefore, teachers should be aware of students' affective beliefs and inter relations of those in learning mathematics so as to employ more effective strategies in teaching and to improve students' mathematics learning by reducing their negative beliefs. This study aims to identify the difficulties felt by students in learning mathematics students' affective reasons for disliking mathematics and to know how their motivational beliefs relate to their liking of subject and expectancy about its difficulty.

## Chapter 2 Methodology

The research is designed to determine the direct, indirect and total effects of factors that affect students' attitude towards mathematics. This study is a quantitative and cross sectional study, employing the use of questionnaire to collect data.

## 2.1 Participants

This research is conducted at university of Debarik in Debarik and around semen Gonder, wekn, dabat, district. Students were selected based on criterion sampling (Patton, 1990; Yildirim and Simesek, 2005). 48 students (16 successful, 16 average, and 16 unsuccessful) from lower grade student and high level of education students participated in this study. The selection criteria were students' math exam results and their class teacher's observations.

## 2.2 Instrument

Difficulties in learning mathematics questionnaire is administered to obtain data on students likes and dislikes, motivational beliefs, learning strategies and their perceptions regarding difficulties in learning mathematics. This questionnaire includes open ended as well as scaled items.

## 2.3 Procedure

After creating rapport with students, and giving re-assures on anonymity and ensuring their willingness to provide the data approximately one hour were allowed for completing the questionnaire with factual clarification from the administrator wherever required.

### 2.3.1 Data collection

Data were collected through semi structured interview techniques. In order to establish construct validity of the interview questions, a panel of field experts was sent the questions to get their opinions. Based on their feedback, questions were finalized. All data collection process were recorded and short notes were taken on the interview form. Factors that affect attitude were determined based on the following indirect questions:

- What do you think about math course? What do you feel about math course?
- What kind of factors affects you like math course?
- What kind of factors affect you dislike math course?
- Do you establish connection between what you learned from math course and real life? Do you use knowledge you get from that course directly in your life?
- Is there anybody who affected you love/hate math courses? Who are they? How?
- How does your teacher teach you the math course? Do the teachers use any material at his class?
- What are your expectations from math course?
- Did you take math exam till now? Can you give examples from those exams?

### 2.3.2 Data Analysis

Data analysis process has gone through the following steps. First, data is read many times to understand and decide coding process. Then, data were coded. Later those codes were collected under some themes. Finally, data coded based on ABC theory. Thus, data were coded based on theoretical coding and it was visualized.

### 2.3.3 Finding Factors that affect students' attitude towards math course positively

Those factors are related to connecting math topics with real life, using materials in teaching math, teachers' personality, teachers' content knowledge, teachers' classroom management and students' opinion about math course.

## Chapter 3 Result

Mathematics is most liked subject for only 5(10%) students and it is the hated one for 45 (88%) students. Their main reasons for hating mathematics were difficulty in understanding the subject, poor instruction and demand of more time to grasp, but even after which they easily forget what is learnt. Among the 51 students, 82% of students reported that they do not like mathematics, and among these students 75% has a belief that mathematics is a difficult subject. When 20% rated mathematics as a very difficult subject, 54% reported medium difficulty, and only 10% considerate as an easy subject. Around 42% fail to identify the ways to solve problems provided in their textbook. Even as 63% find it as boring and 58% of students fear mathematics, still, 43% felt learning mathematics as interesting. Despite this, 82% of students are willing to learn mathematics. A large division of students use blind strategies in learning mathematics and possess less adaptive self-efficacy beliefs and epistemology-logical beliefs but majorities of students are accepting the utility value of mathematics. Higher proportion of students (65%) found algebra as difficult rather than geometry (12%).

Liking mathematics affects student interest, boredom, self-efficacy beliefs and task value beliefs related to mathematics. Feeling mathematics as difficult for students affects not only their liking of mathematics but also their perseverance, interest, boredom and self-efficacy beliefs related to mathematics. Whereas feeling of mathematics as a difficult subject is significantly associated with low perseverance predictably, students who feel mathematics as difficult tends to have low interest in learning mathematics significantly more than those who feel mathematics as easy and students who feel mathematics as difficult tends to feel boredom in mathematics significantly more than those who feel mathematics as easy Students. Self-efficacy belief is significantly dependent on their feeling of difficulty in mathematics that is students who feel mathematics as

difficult tends to have negative self-efficacy and those who felt easy tends to have positive self-efficacy for learning mathematics. Despite these, students who feel mathematics as a difficult subject tends to hold significantly low task value belief than those who feel mathematics as easy.

### 3.1 Discussion

Mathematics is considered a difficult subject by most of the students due to aversive teaching style, difficulty in following the instruction, difficulty in understanding the subject, and difficulty in remembering its equations and ways to solve problem. The same reason is given by students for disliking mathematics and there is a strong association between their belief regarding the difficulty of subject and dislike towards math. That implies, students dislike mathematics as they perceive it as a difficult subject. Also, the association of two with I can/can.t do math. (self-efficacy) is significant. Perception of math as a difficult subject is associated strongly to lower self-efficacy than disliking of the subject. This finding supports very much the findings of Zan and Martino (2008) that students like mathematics as they can do it and dislike it as they can.t do it. Liking of mathematics is associated with more positive affects like interest, positive expectations, higher self- efficacy and personal values towards math, whereas dislike is associated with boredom, low self -efficacy, fear and negative expectancy.

Mathematics has some inherent difficulties due to its abstract and cumulative nature. So students requires a firm foundation, they may not be able to learn new things without previous knowledge. For many students expectancy about the difficulty of math is high, and personal value attached with math is low. In the case of these students, the chance for developing an avoiding or escaping tendency will be high. More number of students perceives algebra as difficult area in comparison to geometry; may be due to its abstract nature and use of variables and may be because, in the case of geometry, more daily life examples are possible.

Half of the students hold positive self-efficacy belief and other half have negative self-efficacy. Self-efficacy affects students, motivation, persistence and achievement (Zimmerman, Bandura and Martinez-Pons, 1992; Liu and Koirala, 2009). Almost all studies on self-efficacy and achievement propose that self-efficacy is an essential motive to learn. As the students lack self-efficacy to learn mathematics their effort also will be low. Students are accepting the utility value of mathematics, but they haven.t any personal value attached with mathematics. So, though they do not like mathematics they may choose to study because of its practical value. But when a task is difficult to them chance for avoiding that task will be higher.

One of the positive beliefs students hold that they can do better if they try hard; they are accepting the value of effort. Thus, reciprocal relationships exist between every attitudinal measure and mathematics achievement, and he feeling of enjoyment directly affects mathematics achievement (Ma, 1997); we call for teachers, attention on effect of their students learning. Perceived difficulties, lack of self-efficacy, dislike, boredom, negative beliefs and lack of task value causes for low participation by students in mathematics (Brown, Brown and Bibby, 2008). Teachers need to use effective ways to motivate students to learn mathematics regardless of student difficulties. Teachers can contribute to improve students, liking of the subject by improving students affective beliefs.

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