

Attitude and Performance in Mathematics I of Bachelor of Elementary Education Students: A Correlational Analysis

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Abstract

This paper determines the relationship between attitude and performance in Mathematics of 105 Bachelor of Elementary Education (BEE) freshman students by using correlational research with the questionnaire as the main instrument. The study found that the performance in Mathematics I of the respondents was below average. Their attitudes are significantly correlated with their performance in Mathematics I. The higher their positive attitude, the higher their performance ($r=0.792^{**}$, $p<0.01$), whereas the higher their negative attitude the lower their performance ($r=-0.940^{**}$, $p<0.01$). Further, the respondents believe that working with Mathematics problems will make them better critical thinkers and they assume that they have more chance of becoming successful in life if they are good in Mathematics. However, the respondents consider Mathematics as the most difficult subject. They were scared of Mathematics problems and easily give up with answering when they cannot solve them. The overall result revealed that the respondents exhibit negative attitude towards Mathematics. The significant findings of this study provide valuable information for Mathematics teachers, administrators and curriculum planners to enhance policies and pedagogies relating to Mathematics instruction.

Keywords: Attitude; Elementary Education; Math Anxiety; Performance in Mathematics I.

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1. Introduction

Attitudes are the most conspicuous aspects of the entire social life [1]. Experts in the field of education are aware of the crucial role of attitudes in the overall educational development of an individual.

Attitudes play a crucial role in Mathematics since it has always been perceived as one of the most difficult subjects to study.

Psychologists pointed out that attitudes of students toward Mathematics are learned in basic education. Since the elementary education teachers are influential in the formation of these attitudes, they should be knowledgeable in the effect of attitudes toward studying Mathematics. According to the report in [2], Philippines is lagging behind other Asian countries in terms of the different tests administered in the country and abroad. One of the reasons given was the unfavorable attitudes towards Mathematics of the Filipino students. Another reason pointed out is the lack of competent teachers who are primary source for elementary in lieu of the books and other learning material. The number of new elementary teachers is declining and the passing rate for the Licensure Examination for Teachers has remained low and in-fact, has decreased from 35.7% in 2000 to 30.8% in 2006 to 27.42% in 2015 [3].

In the study of Dumas, et.al as cited by the authors in [4], they made an assessment of certain mathematical competencies of a little over three thousand elementary school teachers in the country and found out that although the respondents were supposed to be elementary Mathematics teachers, 40% of them would not have chosen to teach Mathematics had the choice been theirs. Considering this attitude of mathematics teachers in the basic education level, what kind of attitude are they going to impart to their elementary pupils? Will it contribute to low quality of education and low performance in Mathematics? And since according to psychologists, positive and negative attitudes of students in Mathematics are developed at the early stages of their life, will it mean that the attitudes of teachers will be acquired by their pupils?

Based on the above premises, the researchers want to find out the attitudes toward Mathematics of selected Bachelor of Elementary Education (BEE) freshman students. The researchers are also interested in looking into the correlation between the attitude towards mathematics of the respondents and their academic performance to verify or find out if attitudes affect achievement in Mathematics. The result may serve as a benchmark for the researchers to develop a plan of action that will help freshman BEE students with their existing problems in Mathematics.

It is in this regard that this study finds meaning and significance.

2. Materials and Methods

This study utilized correlational research design. Correlational research is employed to test the degree of relationship between two or more variables [5]. The 105 Bachelor of Elementary Education freshman students (83 females and 22 males) were selected using simple random sampling. The author in [6] states that random sampling is the process of taking samples in which every member of the population has an equal chance of

being selected as respondents.

The questionnaire used in this study is the Mathematics Attitude Scale Inventory constructed and was validated by Dr. Milagros Dimal Ibe of the University of the Philippines, Diliman, Quezon City. The instrument is a likert-scale type which is composed of 30 items, for which 16 are positive and 14 are negative. For the performance in Mathematics I, the researchers utilized the average of preliminary and midterm grades of the respondents.

The statistical tools utilized in this study were frequency, percentage, mean and Pearson product moment of correlation.

3. Results and Discussion

3.1. Performance in Mathematics I

Table (1) revealed that 45 or 42.86% of the respondents were at the grade range of 75 to 79 (poor), 29 or 27.62% were at the range of 80 to 84 (below average), 17 were at the range of 85 to 89 (average), 12 or 11.43% were at the grade range of 90 to 94 and 2 or 1.90% respondents reached the outstanding level at the grade range of 95 to 100 in their grade weighted average (GWA) in mathematics I.

Table 1: Distribution of the Respondents in terms of their Performance in Mathematics I

Grade Range	Verbal Description	Frequency	Percentage
95 to 100	Outstanding	2	1.90
90 to 94	Above Average	12	11.43
85 to 89	Average	17	16.19
80 to 84	Below Average	29	27.62
75 to 79	Poor	45	42.86
Total		105	100.00
Mean	82.10 (Below Average)		

Overall, the performance in Mathematics I of the respondents is below average (82.10). This finding intends to convey that the respondents were weak in Mathematics. The finding was supported by different studies that appear in [7]: in the studies conducted by the authors in [7], findings revealed that entering freshman students were weak in almost all areas of Mathematics and were not ready for college mathematics; that first year college's level of proficiency in Mathematics is poor; and that majority of the students performed poor in their achievement in Mathematics.

3.2. Positive Attitude of the Respondents toward the Study of Mathematics

Table (2) presents that the overall weighted mean is 2.58 which means that the positive statements (PS) are slightly true to the respondents and implies that their positive attitudes regarding Mathematics is low.

The respondents were positive that improvement on thinking and reasoning skills (PS2-WM=4.21) and becoming more successful in life (PS6-WM=4.20) were the two benefits of being good in Mathematics.

However, it can also be observed that they consider Mathematics as their least favorite subject(PS13-WM=1.45).

The finding infers that although the respondents do not like Mathematics, they are aware that an individual who is involved in Mathematics will be most likely to develop critical thinking skills and will be more likely to succeed in life.

Table 2: Positive Attitude of Respondents Toward Mathematics

Positive Statements (PS)	Weighted Mean	Verbal Description
1.In school I thoroughly enjoy Mathematics classes.	1.70	NTTM
2.When I work with Mathematics problems, I find that my thinking and reasoning are sharpened.	4.21	VTTM
3.I am interested to acquire further knowledge in Mathematics.	3.59	TTM
6.I think I have more chances of becoming successful if I am good in Mathematics.	4.20	VTTM
10.I enjoy going beyond the assigned work in Mathematics and I try solving more than what is expected of me.	1.61	NTTM
11.Mathematics makes me more inquisitive about things which are not clear to me.	3.52	TTM
13.My favorite subject is Mathematics.	1.45	NTTM
15.My parents love and enjoy Mathematics.	1.84	STTM
17.I feel happier in my Mathematics class than in any other class.	1.74	NTTM
18.I think my mind works well when doing Mathematics problems.	3.50	TTM
20.I feel I have a good foundation in Mathematics.	1.70	NTTM
21.The people I enjoy going with are those who are good in Mathematics.	2.19	STTM
23.Mathematics is a subject which I have always enjoyed studying.	1.90	STTM
24.I find Mathematics useful for problems of everyday life.	3.00	MTTM
25.Mathematics gives me such satisfaction	2.85	MTTM
27.In Mathematics, I am not satisfied with just a passing grade; I want really something high.	2.29	STTM
Overall Weighted Mean	2.58	STTM

Legend: 1.00 to 1.79 Not true to me (NTTM); 1.80 to 2.59 Slightly true to me(STTM);2.60 to 3.39 Neutral/Moderately true to me(MTTM); 3.40 to 4.19 True to me (TTM); 4.20 to 5.00 Very true to me (VTTM)

According to the author in [8], everyone agrees that learning math can be difficult, but some people believe

math is important and some people believe math is not important. Math is important since math is everywhere. Math is used in everyday life; it is useful, but it is more than just useful. Math is there to help us, to keep us well ordered, to help us learn new things, and to help us teach new things. Students will become adults who will use math in their jobs. All kinds of careers, to be successful, use math; for example, musicians, accountants, fashion designers, and mothers use math. However, math is not only used for things you do. It also brings order to everything around you; the world is organized essentially because it was made with math.

3.3. Negative Attitude of the Respondents toward the study of Mathematics

Table (3) shows the overall weighted mean is 3.40 which means that the negative statements are true to the respondents and implies that they have negative attitude towards studying Mathematics.

It can be noted on the table that among the negative statements, NS9 “Mathematics problems scare me”, has the highest weighted mean of 4.22 and NS22 “I easily give up when I cannot solve a Mathematics problem”, with a weighted mean of 4.20 were very true to the respondents. This finding implies that the respondents have math anxieties in terms of solving problems. The author in [9] defines math anxiety as "a feeling of tension, apprehension, or fear that interferes with math performance". He stated that highly anxious math students will avoid situations in which they have to perform mathematical calculations. A Math anxious student become so uncomfortable when confronted on mathematical tasks that he/she can experience physical symptoms including increased heart rate, nervous stomach and breathing difficulties that prevent them from concentration and learning. These feelings have been traced to be caused by variety of sources, including negative experiences in the classroom, poor self-image, lack of appreciation for the application of Mathematics to “real life” and shyness that prevents them from asking questions.

Table 3: Negative Attitude of Respondents Toward Mathematics

Negative Statements (NS)	Weighted Mean	Verbal Description
4.I feel uncomfortable with numbers and symbols.	3.41	TTM
5.I am too nervous to think in my Mathematics class.	3.34	MTTM
7.I am unable to think clearly when working with Mathematics.	3.37	MTTM
8.Mathematics makes me feel as though I am lost in a jungle of numbers and I cannot find my way out	3.38	MTTM
9.Mathematics problems scare me.	4.22	VTTM
12.I would willingly exchange my Mathematics subject for an easier subject in school.	3.89	TTM
14.Of all my teachers, it is my Mathematics teacher that I like the least.	3.27	MTTM
16.If I had my way I would avoid taking Mathematics subjects in College.	1.83	STTM
19.I would be happy if Mathematics were to be taken out of the curriculum.	1.59	NTTM
22.I easily give up when I cannot solve a Mathematics problem.	4.20	VTTM
26.I consider Mathematics as my most difficult subject.	4.12	TTM
28.I think I will stand a better chance to succeed in my college course if it does not require Mathematics.	3.31	MTTM
29.I always need someone to help me with Mathematics because it confuses me.	3.68	TTM
30.My poorest mark is usually in Mathematics.	4.02	TTM
Overall Weighted Mean	3.40	TTM

Legend: 1.00 to 1.79 Not true to me (NTTM); 1.80 to 2.59 Slightly true to me (STTM); 2.60 to 3.39 Neutral/Moderately true to me (MTTM); 3.40 to 4.19 True to me (TTM); 4.20 to 5.00 Very true to me (VTTM)

Moreover, the authors in [10] stated that negative attitudes are the result of frequent and repeated failures or problems when dealing with mathematical tasks and these negative attitudes may become relatively permanent. According to them, when children first go to school, they usually have positive attitudes towards Mathematics. However, as they progress, their attitudes become less positive and frequently become negative at high school. The authors in [11] found significant differences between younger and older students' attitudes towards mathematics with 8th graders having lower attitudes than 6th graders. There are a number of factors which can explain why attitude towards mathematics become more negative as school grade progresses, such as the pressure to perform well, over demanding tasks, uninteresting lessons and less than positive attitudes on the part of teachers [10].

3.4. Correlation between the Attitude and the Performance in Mathematics I of the Respondents

The table (4) shows the significant relationships that exist between the positive and negative attitudes of the respondents and their performance in Mathematics I.

Table 4: Correlation Between Attitude and Academic Performance

Mathematics I	Positive Attitudes	Negative Attitudes
Performance (r-value)	.792**	-.940**
Sig. (2-tailed)	0.000	0.000
N	105	105

**correlation is significant @ 0.01 level

Positive attitude is significantly related to performance in Mathematics I. The positive r-value of .792** ($p < 0.01$) means that the higher the positive attitude in Mathematics, the higher the respondent's GWA. Likewise, negative attitude in Mathematics is significantly related to the respondents' performance in Mathematics I. The negative r-value = -.940** ($p < 0.01$) means that the higher the negative attitude in Mathematics of the respondent, the lower is his/her performance in Mathematics I. This implies that students with positive attitude in Mathematics performed better than those students with negative attitude.

A positive attitude towards mathematics reflects a positive emotional disposition in relation to the subject and, in a similar way, a negative attitude towards mathematics relates to a negative emotional disposition [12]. These emotional dispositions have an impact on an individual's behavior, as one is likely to achieve better in a subject that he/she enjoys, has confidence in or finds it useful. For this reason, positive attitudes towards mathematics are desirable since they may influence one's willingness to learn [13].

4. Conclusions and Recommendations

The study found out that the performance in Mathematics of the respondents was below average. As to positive attitudes, the respondents believe that when they work with Mathematics problems, they find that their thinking and reasoning are sharpened. In addition, they believe that they have more chance of becoming successful in life if they are good in Mathematics. In terms of the negative attitudes, most of the respondents were scared of Mathematics problems and they easily give up with answering when they cannot solve the problems and stated that they consider Mathematics as the subject they find most difficult. There is a significant correlation that exists between attitudes and performance in Mathematics I of the respondents. The findings revealed that the higher the positive attitude, the higher the performance in Mathematics I while the higher the negative attitude the lower the performance in Mathematics I. Overall, the respondents exhibit a negative attitude towards Mathematics. However, since the study only investigated students studying in the private colleges and universities, the findings does not translate to Bachelor of Elementary Education freshman students enrolled in state colleges and universities. Based on the results, the researchers recommend that Mathematics teachers may exert more effort to try new teaching styles and strategies that will improve instruction in Mathematics for the benefit of the students. The same study may be undertaken for the BEEEd freshman students of state colleges and universities and include the Math grade in high school as additional variable, which this study fails to include. Lastly, curriculum planners should develop a curriculum that is experiential especially in Mathematics because expert psychologists and mathematicians say that learning Mathematics can be made easier and enjoyable if curriculum includes mathematical activities and games. Maths puzzles and riddles encourage and attract an alert and open-minded attitude among youngsters and help them develop clarity in their thinking. Emphasis should be laid on development of clear concept of Mathematics in a child, right from the primary classes[14]. Teachers may also venture on other means of spreading the knowledge of Mathematics among children which is through peer-teaching. Once a child has learned a concept from his teacher, the latter should ask him to explain the concept to his fellow students. Through the process, all the children will be able to express their doubts on the topic and clarify them through group discussions.

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