Exploring Mathematical Ability of Teacher Education Students

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Abstract: Mathematics teachers as facilitators of learning in a mathematics classroom are expected to achieve the goals of teaching such as acquisition of knowledge, cultivation of skills, and development of positive values and attitudes among students. This study explored the mathematical ability of Teacher Education students of Batangas State University JPLPC-Malvar. Specifically, this study sought answers to the following questions: What is the profile of the respondents in terms of sex, type of school graduated from, grade-point average, and program enrolled; What is the level of mathematical ability of the respondents?; Is there a significant relationship between the respondents' profile and their level of mathematical ability?; and, What is the implication of the findings of this study to mathematics instruction? A researcher-made test was the main instrument used to determine the mathematical ability of teacher education students. After careful tabulation, statistical treatment, analysis and interpretation of data, the following findings were revealed. There was no significant relationship between the subjects' level of mathematical ability and their profile in terms of sex, type of school graduated from and their general weighted average. However, significant relationship exists between the level of mathematical ability of the respondents and the program they are enrolled. Furthermore, there is a need for teachers to show greater concern and motivation for the students' welfare. Students, on the other hand, must also exert effort in learning how to learn.

Considering the conclusions drawn in this study, the researcher recommended that a diagnostic test must always be given to freshmen at the start of the semester to find out their strengths and weaknesses in Mathematics. Aside from that, the department could also conduct activities that will enhance the skills of the students regarding mathematics subjects must be given to students to help them in the difficulties they encounter regarding the subject. Difficulties experienced by the students should also be identified to discover whether their mathematical ability has improved after measures have been undertaken.

Keywords: Mathematical Ability, Teacher Education Students.

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Introduction

Mathematics plays a significant role in the education of every individual. It deals with concepts such as quantity, structure, space and change. It evolves, through the use of

abstraction and logical reasoning. It is also used in many fields, including science, engineering, medicine and economics. The application of mathematics to such fields, often dubbed applied mathematics, inspires and makes use of new mathematical discoveries and has sometimes led to the development of entirely new disciplines. Knowledge of basic mathematics is widespread, as it has been used throughout history.

In reality, many do not understand mathematics because of its being abstract in nature. The difficulties of the learners and performances in mathematics have been the subjects of several studies which continuously reveal that generally students do not perform well in mathematics.

The evolution of mathematics might be seen to be an ever-increasing series of abstraction or alternatively an expansion of subject matter. One of the earliest abstractions is the representation of numbers. Devlin (2007), in his article stated that the evolution of mathematical ability is fairly lengthy. Part of the reason for the argument's complexity is that mathematics is a very recent phenomenon in evolutionary terms. Thus, doing mathematics must comprise making use of mental capacities that pre-date mathematics by tens or hundreds of thousands of years, capacities that found their ways into the human gene pool because they provided our early ancestors with survival advantages - being good at math not being one of them back then. No wonder, mathematics is the most disliked and the most difficult subject for most students.

For teachers, the most difficult part in teaching Mathematics is the incapability to impart the knowledge of Math to the level of understanding and interest of the student which often result to poor mathematical performance of the learner (Oriondo, 2002). Young learners need to be instructed and educated in a systematic manner by teachers, who are knowledgeable enough in the field (Marasigan, 2018).

Teachers, on the other hand, have a very big role in fostering knowledge to students because through their teaching, the knowledge of the students are increased and enhanced even so the personality of the students is molded. For the teachers to know what and how to teach the students, testing could be useful. Testing is a technique of obtaining information needed for evaluation purposes. Tests serve many functions. They provide information that is useful for improvement of instruction, in making administrative decision and for guidance purposes. It also helps students to identify their own strengths and weaknesses, making them more aware of how they can improve themselves.

The researcher believes that knowledge is a weapon to survive. No one in this world lives without knowing anything. For a man to be successful in life, he should be knowledgeable about many things. This is the reason why students are studying and students are the reasons why schools were built. This is also the reason why teachers were born. Teachers are the facilitators of learning. They are expected to achieve the goals of teaching such as acquisition of knowledge, cultivation of skills, and development of the positive values and attitudes among students.

As a Mathematics educator, the researcher is concerned and interested in determining the mathematical ability of future teachers for they are the ones responsible to spread the knowledge in the world. Since Mathematics is one of the elements in the global modernization, it should not be taken for granted if one of the students is showing low level of ability in Mathematics.

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Objective of the Study

This study explored the mathematical ability of Teacher Education students of Batangas State University JPLPC-Malvar. Specifically, this study sought answers to the following questions: What is the profile of the respondents in terms of sex, type of school graduated from, gradepoint average, and program enrolled; What is the level of mathematical ability of the respondents?; Is there a significant relationship between the respondents' profile and their level of mathematical ability?; and, What is the implication of the findings of this study to mathematics instruction?

Methodology

The main purpose of this study was to determine the mathematical ability of the freshmen from Bachelor of Elementary Education and Bachelor of Secondary Education at Batangas State University in accordance to their demogprahic profile.

The researcher used the descriptive method to describe the nature of the study. In addition, the researcher used a 30-item test that was given to the students. The results from this test were interpreted as follows:

Range	Verbal Interpretation	
21-26	Above Average	
15-20	Average	
9-14	Below Average	

The data that were gathered were statistically treated through frequency and percentage, mean, and Chi-Square. To facilitate the computation of data, the MINITAB statistical software was utilized.

Results and Discussion

This part of the study determined the profile of the respondents in terms of sex, type of school graduated from, grade-point average, and program enrolled. It ascertained the level of mathematical ability of the respondents.

It also determined if significant relationship exist between the respondents' profile and their level of mathematical ability. The data were presented using frequency and percentage, and chi-square.

1. Profile of the Respondents

This presents the respondents' profile in terms of sex, type of school graduated from, general weighted average and the program enrolled.

Table 1. Frome of the Respondents in Terms of Sex				
Sex	Frequency	Percentage		
Male	4	7		
Female	50	93		
Total	54	100		

Table 1. Profile of the Respondents in Terms of Sex

This shows that majority of the respondents are female. This shows that females are more inclined to teaching profession. This may be a proof to the fact that majority of the teachers in the Philippines are females.

Type of School Graduated From	Frequency	Percentage
Public	43	80
Private	11	20
Total	54	100

Table 2. Profile of the Respondents in Terms of Type of School Graduated From

The information presented in the table gives justification to the certainty that only few are those who can afford to study in private schools. This is because of having middle and below middle class socio-economic statuses of the families of the students.

General Weighted Average	Frequency	Percentage
87.00 - 96.99	14	26
83.00 - 86.99	28	52
76.00 - 82.99	12	22
Total	54	100

 Table 3. Profile of the Respondents in Terms of General Weighted Average

Table 3 presents the profile of the respondents in terms of general weighted average. The general weighted average of the respondents was their final average in their fourth year high school.

Program Enrolled	Frequency	Percentage
BEEd	26	48
BSEd	28	52
Total	54	100

Table 4. Profile of the Respondents in Terms of Program Enrolled

The number of students who are enrolled in the BEEd program does not differ much from the number of students who are enrolled in the BSEd. This implies that students are equally interested in teaching elementary and high school levels.

2. Level of Mathematical Ability of the Respondents

This presents the level of mathematical ability of the respondents classified as above average, average and below average.

Level of Mathematical Ability	Frequency	Percentage		
Above Average	5	9		
Average	29	54		
Below Average	20	37		
Total	54	100		

 Table 5. Level of Mathematical Ability of the Respondents

Table 5 presents the frequency and percentage distribution of the respondents when grouped according to their level of mathematical ability. The level of mathematical ability of the respondents was categorized according to the scores they got from the achievement test given by the researcher. The table revealed that majority of the respondents had an average performance in the achievement test. However, the number of students who got below average scores is greater than the number of students who got above average scores.

1.998

Mathematical

Ability

Not Significant

3. Relationship between the Respondents' Profile and their Level of Mathematical Ability

The relationship between the profile and the level of mathematical ability of the respondents was tested using the Chi - square formula.

	Ĩ	Respondents	5	v
Variables	Computed Value	Tabular Value	Decision (H ₀)	Verbal Interpretation
Sex & Level of				

Accept

5.991

Table 6. Relationship between Sex and Level of Mathematical Ability of the

This indicates that there is no significant relationship between sex and level of mathematical
ability of the respondents. This implies that sex is not a predictor of students' performance in
Fundamentals of Mathematics. Whether it is about other subjects or mathematics, the ability
and intelligence of the students are not influenced by their sex but by how they were
educated.

Table 7. Relationship between Type of School Graduated from and Level of
Mathematical Ability of the Respondents

Variables	Computed	Tabular	Decision	Verbal
	Value	Value	(H ₀)	Interpretation
Type of School Graduated From & Level of Mathematical Ability	2.388	5.991	Accept	Not Significant

This reveals that there is no significant relationship between the type of school graduated from and level of mathematical ability of the respondents. This may be attributed to the fact that the type of school graduated from by the students did not influence their mathematical ability.

Whether students came from private or public school, their performance in mathematics could not be predicted. This was supported by of Dua (2000) as he asserts in his study that family income occupation of the parents and the socio-economic status of their families had no significant relationship with the mathematics achievement of these students.

Table 8. Relationship between the General Weighted Average and Level of
Mathematical Ability of the Respondents

Wathematical Ability of the Respondents				
Variables	Computed	Tabular	Decision	Verbal
v al lables	Value	Value	(H ₀)	Interpretation
General				
Weighted				
Average &	1 750	0.499	Accort	Not Cignificant
Level of	1.750	9.400	Accept	Not Significant
Mathematical				
Ability				

Based on the results, the null hypothesis was accepted.. It signifies that there is no significant relationship between the general weighted average and level of mathematical ability of the respondents. This may be attributed to the fact that students with above average performance in high school do not necessarily perform well in Fundamentals of Mathematics in the college level.

This study is somewhat correlated to the study of Tapia (2003). Based on the researcher's findings, mental ability was found not to be the most predictor of student's achievement in mathematics and that mental ability is not constant. This reveals that an achievement of a student in his high school level does not give assurance that he will perform well in mathematics in his tertiary level. It will still depend on how the student will handle his learning in mathematics and how his instructors in math will impart him knowledge that he needs.

Table 9.	Relationship between	Program Enrolled an	nd Level of Mathematical A	Ability of
		the Respondents		

Variables	Computed Value	Tabular Value	Decision (H ₀)	Verbal Interpretation
Program Enrolled &	6 248	5 001	Pajact	Significant
Mathematical Ability	0.248	5.991	Reject	Significant

Table 9 reveals that there is a significant relationship between the program enrolled and level of mathematical ability of the respondents. This implies that students who are enrolled in Bachelor of Secondary Education have different level of mathematical ability with those students who are enrolled in Bachelor of Elementary Education. This may be due to the fact students who prefer to teach high school students in the future are more inclined in mathematics considering that they might teach the subject even though they do not specialize in the area. As observed in most secondary schools particularly in public schools, other areas are taught by teachers depending on the need of the school where they are connected.

4. Implication of the Findings of the Study to Mathematics Instruction

Determining the mathematical ability of first year college students would give the department enough information about their performance in Fundamentals of Mathematics. The teacher, to facilitate learning among students must have the knowledge, skills and enthusiasm to be effective and efficient in front of the students especially in teaching Mathematics because students oftentimes find difficulty in understanding the subject. Before understanding higher levels of Mathematics, students should first have a strong foundation in the basic concepts which is being taught in Fundamentals of Mathematics. It is therefore the responsibility of the mathematics teachers in the Teacher Education Institution to provide students the necessary information so that their students would be competitive in the future.

With all these, the researchers believe that learning Mathematics and acquiring mathematical ability would be easy for the students with the help and effort of their teachers for an improved mathematics instruction.

Conclusion and Recommendation

This study explored the mathematical ability of teacher education students at Batangas State University JPLPC-Malvar. It revealed that there was no significant relationship between the subjects' level of mathematical ability and their profile in terms of sex, type of school graduated from and their general weighted average. However, significant relationship exists between the level of mathematical ability of the respondents and the program they are enrolled. Furthermore, there is a need for teachers to show greater concern and motivation for the students' welfare. Students, on the other hand, must also exert effort in learning how to learn.

Considering the conclusions drawn in this study, the researcher recommended that a diagnostic test must always be given to freshmen at the start of the semester to find out their strengths and weaknesses in Mathematics. Aside from that, the department could also conduct activities that will enhance the skills of the students regarding mathematics subjects must be given to students to help them in the difficulties they encounter regarding the subject. Difficulties experienced by the students should also be identified to discover whether their mathematical ability has improved after measures have been undertaken.

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