

Sex-Role in Mathematical Dichotomy among Grade 7 Students in Bongabong South

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Abstract: Mathematics has always been considered as one of the most important subject in the curricula, for it has a wide range of application to almost all field of endeavor. However, there are still great number of students who encountered problems and difficulties in mathematics. Among the factors that could affect the students' performance in mathematics is their attitude towards the subject be it positive or negative and their individual differences. This study was conducted to determine the mathematical dichotomy of male and female Grade 7 students of Bongabong South primarily to compare the sex role in mathematics. This is a Descriptive and comparative study wherein a questionnaire was utilized as the main data gathering tool. The statistical treatment includes Mean and ttest for independent samples. The result showed that the male and female respondents have different level of positivity and negativity when it comes to mathematics. Further, the female respondents showed higher level of positivity than male but the male respondents showed greater level of negativity than the females.

Keywords: sex-role, mathematical dichotomy, Grade 7 students, positivity, negativity

I. INTRODUCTION

LEARNING mathematics is important to almost all fields of endeavour in today's diverse society. Despite its usefulness and wide application, mathematics is perceived by most students as boring, difficult, not very practical and abstract [1]. Mathematics can appear as foreign language to many for it has its own alphabet, comprised of numbers and figures, and is constructed with a complicated syntax [2]. These resulted to the prevalent problem on the poor performance of students on mathematics. However, there are various factors that could affect the students' success in mathematics, one of them is attitude towards mathematics [3]. When the students are anxious, distressed, uneasy and frightened, the students tend to lose interest to learn mathematics which leads to disengagement, increased anxiety, lack of confidence and reluctance to try to improve skills [4] associated with delayed acquisition of core Math and number concepts and poor math competence [5]. Additionally, there

are various reasons for negative attitude towards Mathematics [5], these are internal factors such as individual perceptions, characteristics [6] and behaviour [7].

The complexity of the factors that affects mathematics performance is presented by Singh et al, [8] that high performance in mathematics is caused by interrelated variables related to students, families and schools. Among student variables, attitude is regarded by most researchers as an important factor that could help to understand and explain the students' performance in math [3, 9, and 10].

Attitudes can be seen as positive or negative. A positive attitude disposition towards mathematics reflects a positive disposition in relation to the subject and, consequently, a negative attitude disposition towards mathematics relates to a negative emotional disposition [9]. These emotional dispositions affect the individual's behaviour, students who enjoy math more likely to have confidence and greater achievement than those who do not enjoy it [11]. Because of this, it is desirable that students should possess positive attitude towards mathematics for it may influence one's willingness to learn [11].

Negative culture around mathematics may be caused by bad experiences in mathematics, math anxiety and lack of support from adults [12]. It can be improved, however, if an adult – a teacher perhaps, can create a more positive and confident culture around mathematics and numeracy [13]. Further, the teacher should provide situations of success for all students to improve their self-efficacy and attitudes towards learning [14] that would highlight his/her positive emotional disposition towards mathematics [6].

A. Sex-role Stereotyping in Mathematics. Math is often considered to be a domain in which boys are considered dominant over the girls when it comes to mathematics achievement, attitudes and self-concept [15, 16]. Stereotypes about female inferiority in mathematics are prominent among children and adolescents, parents and teachers. Parents and teachers believed that male students performed better than girls [17]. These stereotypes can influence competency beliefs or self-efficacy. Correlational researches show that parents' and teachers' sex-role stereotypes predicts children's perception of their own abilities [18-20]. According to some studies, elementary-school boys still report significantly higher mathematics competency beliefs than girls do [21-24]. However, numerous studies showed that mathematics

achievement and performance between boys and girls do not differ significantly [25, 26].

B. Positive/Negative Mathematical Dichotomy. Zan & Di Martino, [6] defined positive attitudes towards mathematics as viewing mathematics as a discipline made of rules to memorize and apply rigidly provided that the student like the subject. On the contrary, negative attitudes towards mathematics referred to the wrong vision of mathematics and the “beliefs about the self” characterized by lack of self-efficacy (“I can’t do it”, “I don’t know how to do it”). Further, fostering positive attitudes and perception about learning emphasizes open-mindedness, wholeheartedness, and responsibility and thinking [27].

C. Attitudes and School Grades. Nicolaidou and Philippou [10] showed 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. At first, children go to school with positive attitudes towards math but gradually become less positive as they progress and to some become negative when they reach high school. These could be attributed to pressure to perform well, over demanding tasks, uninteresting lessons and less than positive attitudes on the part of the teachers [10].

D. Sex and Attitude towards Mathematics. Elementary school students’ attitudes towards mathematics is not significantly different in terms of gender, [3, 9, 28, 29], therefore, it is more important to focus on other factors such as motivation and that mathematics should be associated with everyday life [9]. Further, gender have no effect on the relationships between attitudes and performance [29] and there is no difference on either in math achievement or in math attitudes. Some studies, though reported gender differences exist, showed that the variance are small [30, 31]. On the other hand, there are studies conducted showing relevant difference in the beliefs of boys and girls, such that girls shows lower math self-concept than boys [32]. When compared with boys, girls lacked confidence, and were anxious about mathematics [16].

II. METHODOLOGY

Objectives of the Study

This study aimed to determine the level of sex-role on mathematical dichotomy among Grade 7 students in public secondary schools of Bongabong South District.

Specifically, it aimed to:

1. determine the level of mathematical dichotomy in terms of positivity of the respondents towards mathematics when grouped according to sex
2. determine the level of mathematical dichotomy in terms of negativity of the respondents towards mathematics when grouped according to sex
3. compare the level of positivity of male and female respondents

4. compare the level of negativity of male and female respondents

Research Design

Descriptive and comparative survey were in used in this study. Descriptive method is characterized by simply an attempt to determine, describe or identify [33] the perception of the male and female respondents on their level of positivity and negativity towards mathematics. Comparative method was used in this study to determine whether male and female respondents vary in their level of mathematical dichotomy.

Participants, Sampling and Setting

The participants of this study was the 268 randomly selected Grade 7 students from the total population of 804. Equal representation of both sexes were utilized in this study which resulted to 134 males and 134 females from five (5) schools in Bongabong District. Slovin’s formula with 5% margin of error was used to determine the sample size of this study while fish bowl method was employed to specifically select the respondents. Informed consent from the school principals, advisers and respondents were secured for ethical considerations. The respondents were also assured of the confidentiality of the information. They were also informed of their right to withdraw their participation in the said study.

Data Collection and Analysis

A set of questionnaire was used as the main data gathering tool for this study. It was validated and pretested prior to its distribution to the respondents. The data gathered was treated using Descriptive Statistics such as mean and percentage. A 5-point scale was used to describe the mean perceptions of the respondents as Very High (5), High (4), Average (3), Low (2) and Very Low (1). Further, an Inferential Statistics as ttest for independent samples was applied to compare the mathematical dichotomy of the male and female respondents.

Results and Discussion

1. level of mathematical dichotomy in terms of positivity

Figure 1 shows the graph about the perceptions of the male and female respondents on their level of mathematical dichotomy in terms of positivity. As the result shows, female respondents have higher level of positivity as compared to males. The highest recorded among the perceptions of females is on the value of mathematics (M = 4.15) regarded as high while the lowest is open-mindedness with mean value of 3.90 also described as high. On the other hand, the male perceived that the value of mathematics is also high with a mean of 3.85 and thought that the least is effort with a mean of 3.72.

Female respondents recognizes learning mathematics as a big help to improve ideas and they could be successful in math through constant practice and hard work. To do so, they take down notes to help them understand and remember when they are learning new mathematical materials and sometimes asks helps from their classmates or teachers if they do not understand some of the mathematical concepts. Male

respondents, however, perceives that mathematics is connected to their experiences in everyday life and they also believed that their skills in mathematics could be improved. Among their strategies are analysing problems carefully before solving them and testing understanding by solving practice exercises and problems.

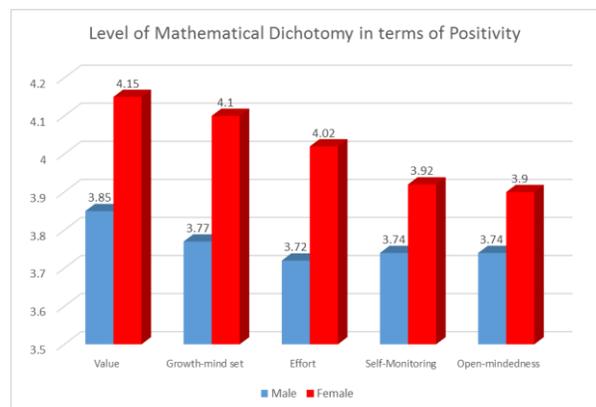


Fig. 1 Level of Mathematical Dichotomy in Terms of Positivity of Male and Female Respondents

2. *level of mathematical dichotomy in terms of negativity*

The males possess higher level of negativity (Figure 2) than the females. Anxiety is recorded the highest among the listed negativity towards mathematics among males with mean value of 3.19 and described as average while misconception is the lowest with mean value of 2.52. The females regarded discouragement as the most experienced negativity while misconception is the least of the negativity towards mathematics.

Male and female respondents experienced frustration when they feel unsure about themselves in problem solving activities. They become discouraged because they approach math with a feeling of hesitation, resulting from fear of not being able to do math. When it comes to misconceptions, male respondents perceive that mathematics is a difficult subject and hated by most students, while the females thought that you only need to memorize solutions and formulas to learn mathematics.

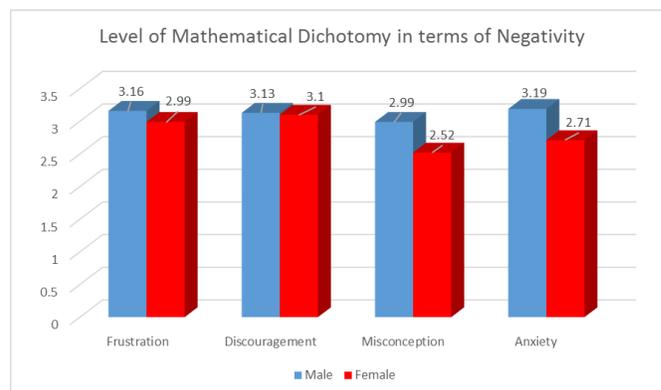


Fig. 2 Level of Mathematical Dichotomy in Terms of Negativity of Male and Female Respondents

3. *Comparison between the level of positivity of male and female students*

Ttest for independent samples was conducted in comparing the mathematical dichotomy of the male and female respondents in terms of positivity. The differences between the perceptions were significant as the value of $p < 0.05$.

TABLE I
COMPARISON OF MATHEMATICAL DICHOTOMY IN TERMS OF POSITIVITY

Positivity	Male		Female		Sig. (2 tailed)		
Positivity	Mean	SD	Mean	SD	t	df	
Value	3.85	0.18	4.15	0.23	-4.5007	267	0.0000**
Growth-mind set	3.77	0.21	4.10	0.18	-4.6212	267	0.0000**
Effort	3.72	0.53	4.02	0.18	-4.2605	267	0.0002**
Self-monitoring	3.74	0.88	3.92	0.42	-2.4232	267	0.0003**
Open-mindedness	3.74	0.72	3.90	0.68	-2.0701	267	0.0000**

4. *Comparison between the level of negativity of male and female students*

There is a significant difference between the misconception among males ($M=2.99$, $SD=0.38$) and females ($M=2.52$, $SD=0.53$), where $t(267) = 4.3402$, $p < 0.05$ and anxiety among males ($M=3.16$, $SD=0.34$) and females ($M=2.71$, $SD=1.08$), where $t(267)=4.3615$, $p < 0.05$. This shows that the male and female respondents have varying level of negativity when it comes to misconception and anxiety. However, they possess

the same level of negativity in terms of frustration $t(267)=1.8326$, $p=0.3547$ and discouragement $t(267)=1.4882$, $p=0.2310$.

TABLE II
COMPARISON OF MATHEMATICAL DICHOTOMY IN TERMS OF NEGATIVITY

Negativity	Male		Female		Sig. (2 tailed)		
Negativity	Mean	SD	Mean	SD	t	df	
Frustration	3.16	1.02	2.99	1.16	1.8326	267	0.3547
Discouragement	3.13	0.87	3.10	0.87	1.4882	267	0.2310
Misconception	2.99	0.38	2.52	0.53	4.3402	267	0.0000**
Anxiety	3.16	0.34	2.71	1.08	4.3615	267	0.0000**

III. CONCLUSIONS

Students generally possess positive attitudes towards learning mathematics [10] as they see the importance and relevance of the subject to real-life situations. They also believe that their skills can be improved by constant practice, by trying different strategies to succeed on a task, by showing reflective thinking and by being open for constructive criticism.

Negative dispositions are present to some students because they feel uneasy and nervous during mathematics class. They also believe in wrong notions about themselves and the subject [1, 6, 7]. Further, they consider themselves as a failure and avoid instances in which they use math skills.

Female respondents showed higher level of positivity for they are aware of the relevance of the subject. Male respondents, on the other hand, possess higher level of negativity towards learning mathematics. Students' attitudes towards mathematics differ significantly in terms of gender [31-33] as male and female respondents have varying level of positivity as they exhibit individual differences and varied dispositions as regard to mathematics learning. In addition, they show different views of negativity in terms of misconceptions and anxiety, however, gender have no effect on the students' attitude [3, 9, 28, 29] when it comes to frustration and discouragement.

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