ANGST: Examining Students' Fears in Mathematics

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***Abstract*—**Math is a fact that can never be avoided because one who can't calculate quickly and confidently will always be pitied. With this, this subject becomes a staple ingredient in the educational systems. However, despite its worth, some students demonstrate fear towards it and regards it as a stuff of nightmare. Upsettingly, students who fear math do not commit themselves to learning it for he does not see any purpose to it.

Hence, this study aimed at examining students' fears in Mathematics as it contemplates at creating measures to lessen students' fears and improve their performance in the subject.

Findings showed that that students, at large, have little fear towards the subject but many possess moderate to high apprehension in Math. Also, Grade 7 students significantly have lower fear in the subject than Grade 8 students.

***Keywords*—**Examining, Mathematics, Mathematics fear, Students

I. Introduction

MATH is an unavoidable fact of life since basic calculations are considered as oils that keep the machinery of society from running smoothly. It is also regarded as a basic skill that every person must acquire for survival because one who is not familiar with the rigorous mathematical reasoning and proof can easily be manipulated and be readily submissive to false prophets and weird predictions [1]. In fact, because of its significance, this subject becomes a staple ingredient in our educational systems nowadays. As one child steps inside the portals of formal education, he also starts learning the basics of math. He is taught simple arithmetic and reasoning. However, in the Philippines' Basic Education, math is considered as the most difficult subject because rote memorization is utilized to teach addition and multiplication. Confusion worsens as teachers introduce the concepts of subtraction and division [2].

With the idea that math is difficult and confusing, many students show fear towards learning it. Despite its significance, negative attitudes of learners become apparent as they are introduced to the different concepts of the subject. Most often than not, some students start fearing the subject even before they start learning it. They feel like computers shutting down when learning the subject [3]. Having fear in math can be associated with stage fright that when one possesses it, he is afraid of the crowd, he is fearful of being judged and he is scared of being completely blank. This anxiety is more than just disliking math; someone with this kind of fear feels negative emotions when indulged in activities that requires numerical or math skills [4]

People who are fearful of math do not only show such apprehension, rather they also perform more poorly than their abilities would suggest when they are exposed to it. It is because the fears they feel towards the subject prevent them from using the knowledge they possess and showing what they know. Worries and self-doubt occur [5].

Fear of math, during these times, rampantly lopes in schools. Students who have fears towards learning the subject are often interfered with their work in math [6] and are impeded to develop themselves mathematically. Math fear has been a problem of many students in any level for it becomes a barrier in achieving students' full potentials in the subject. This problem must be addresses accordingly before it turns into a permanent block [7]. Hence, this study was undertaken.

A. Objectives:

This study aimed at examining the high school students' fears in Mathematics. Specifically, it worked along the following specific objectives:

1. to identify the profile of high school students according to sex, age and year level;
2. to describe the level of fear of the students in Mathematics; and
3. to find out if significant differences exist in the levels of fears of the students in the subject when they are grouped by their profile.

B. Significance of the Study

It is believed that research findings are beneficial for Math teachers, students who are enrolled in Math and school administrators. Math teachers can be helped in determining the level of fear of students in the subject. By knowing it, they can design specific teaching methods and strategies to lessen and even eliminate the fears of students towards learning math. Students, as well, can be of help. They will be able to realize that the subject is of great importance. So, they should not possess apprehension towards it. School administrators will be given the idea in designing particular programs that would address the problem.

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II. Methodology

The study conducted contemplates its use in improving mathematics instruction. This uses the descriptive type of research which enabled the researcher to describe the profile of the high school students of the Quirino State University Laboratory High School in terms of sex, age and year level. Respondents were selected by employing Slovin's formula and stratified ransom sampling.

An adapted questionnaire, from the study of Ozcan and Brewer, was used to be able to identify the level of fear of students in mathematics.

The results of the study give a general picture of the high school students' apprehension level in the subject.

III. Results and Discussion

A. Profile of the Respondents

TABLE I
Respondents as to Sex, Age and Year Level

Variable	Frequency	Percent
Sex		
Male	57	39.04
Female	89	60.96
Age		
15 – 17	52	35.62
12 – 14	94	64.38
Year/Grade Level		
Fourth	31	21.23
Third	34	25.34
Grade 8	37	23.29
Grade 7	44	30.14

There were 146 students who were treated as respondents to the study conducted. There were 57 and 89 male and female students, respectively. As the figures suggest, majority of them are females which is a usual scenario in most schools.

Mean age of the respondents is 13.97. This means that most of them have ages within the age range 12 – 14. Students who have these ages are usually enrolled as Grade 7, 8 or third year.

Most of the students involved in the research are Grade 7 students since there were two sections for the grade level when the study was undertaken.

Accordingly, the population of high school students in the University was dominated by females, with ages 14 and enrolled as Grade 7.

B. Math Fears of Students

From among the items given, it was also found out that the respondents have no fear on following: being given a set of numerical problems involving addition to solve on paper, being given a set of subtraction problems to solve, and reading a cash register or billing receipt after purchase.

TABLE II
Mathematics Fears of High School Students

Statements	Mean	Description
1. Enrolling a math subject	1.81	Low
2. Walking into a math class	1.84	Low
3. Being called in math class to solve problems on the board	2.78	Moderate
4. Reading and interpreting graphs and charts	2.84	Moderate
5. Solving manually complex equations without using calculator	2.68	Moderate
6. Working on an abstract mathematical problem	2.62	Moderate
7. Being given a "pop" quiz in math class	3.08	Moderate
8. Taking quiz in math quiz	2.43	Low
9. Looking through the pages of math book	1.55	Low
10. Listening to another student explain a math formula	2.19	Low
11. Being given a set of numerical problems involving addition to solve on paper	1.46	No Anxiety
12. Being given a set of subtraction problems to solve	1.47	No Anxiety
13. Being given a set of multiplication problems to solve	1.66	Low
14. Being given a set of division problems to solve	1.88	Low
15. Getting ready to study for a math test	2.36	Low
16. Thinking about tomorrow's upcoming math test	2.47	Low
17. Thinking about an upcoming math test one hour before	2.77	Moderate
18. Receiving a homework assignment for many difficult problems due to the next class meeting	2.67	Moderate
19. Picking up a math book to begin working on a homework/assignment	1.82	Low
20. Completing a graded assignment in math class	2.19	Low
21. Realizing you have to take a certain number of math classes before graduating in high school	2.63	Moderate
22. Waiting to get a math test returned in which you expected to do well	2.72	Moderate
23. Taking final examinations in math	3.17	Moderate
24. Receiving your final grade in math	2.94	Moderate
25. Reading a cash register or billing receipt after purchase	1.46	No Anxiety
Grand Mean	**2.30**	**Low**

In addition, the respondents possess moderate fear on: being called in math class to solve problems on the board, reading and interpreting graphs and charts, solving manually complex equations without using calculator, working on an abstract mathematical problem, being given a "pop" quiz in math class, thinking about an upcoming math test one hour before, receiving a homework assignment for many difficult problems due to the next class meeting, realizing they have to take a certain number of math classes before graduating in high school, taking final examinations in math, waiting to get a math test returned in which they expected to do well, and receiving their final grade in math.

C. Students' Level of Fear when grouped by Profile

Based from these findings, majority of the male and female students possess low fear towards the subject. This indicates that both genders have little fear towards math but most of the

respondents who possess low fear towards math are females.

TABLE III
STUDENTS' LEVEL OF FEAR AS TO SEX, AGE AND YEAR LEVEL

Profile Variables	Level of Fear in Math			
	High	Moderate	Low	No
Sex				
Male	3	22	34	8
Female	3	31	44	11
Age				
15 – 17	2	22	23	5
12 – 14	4	31	45	14
Year Level				
Fourth Year	2	15	11	3
Third Year	1	9	22	2
Grade 8	1	22	14	0
Grade 7	2	7	21	14

As to age, the findings showed that majority of the students whose ages fall in the age brackets 12 – 14 and 15 – 17 possess low fear. This means that most of the students who belong to these age groups have a little fear towards the subject.

Results also showed that that majority of the Grade 7 and third year students possess low fear towards mathematics. This means that these groups have a little fear in learning the subject. However, most of the second and fourth year respondents have moderate fear towards the subject. This means that they exhibit quite bad fear towards mathematics.

Generally, the students had little fear in learning Mathematics because they possess low anxiety towards the subject.

D.Significant Differences on Students' Fears when grouped by Profile

TABLE IV
SIGNIFICANT DIFFERENCES ON STUDENTS' FEARS IN MATH AS TO SEX, AGE AND YEAR LEVEL

Factor	T-/F-Value	P-Value	Result	Decision
Sex	-1.907	0.058	Not Significant	Accept Ho
Age	0.102	0.919	Not Significant	Accept Ho
Year Level	4.670*	0.004	Significant	Reject Ho

Results showed that gender and age did not significantly affect the Mathematics anxiety of the students since the corresponding values are higher than 0.05 which led to insignificant results. However, the differences among the mean fears of the students are significant when they grouped by year level. Thus, the null hypothesis (Ho) which states that there are no significant differences on the level of fears of students in math when they are grouped according to year level is rejected. Thus, year level had an effect on their anxiety towards the subject.

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REFERENCES

[1] Oliva, Rietchel F., 2007. The Fundamental Mathematics Skills of the Freshmen College Students of Quirino State College. Quirino State College, Diffun, Quirino.
[2] Manila Bulletin (August 22, 2012). "The Mathematics of failure by Philippine schools."
[3] Sutter, Cheryl M. (2006). The Anxiety Levels and Perceptions of Mathematics Learners from a Midwestern Technical College on Selected Classroom Climate Factors in Mitigating the Effects of Math Anxiety. University of Winconsin-Stout..
[4] The Associated Press (May 31, 2011). "Researchers say math anxiety starts young" by Sarah D. Sparks and Education Week.
[5] Beilock, Sian L., et. al. (2009). Female Teachers' Math Anxiety Affects Girls' Math Achievement. Columbia University, New York City.
[6] Mathematics Learning…. Sharing Strategies by Rashmi Kathuria(2007).http://mathematicslearning.blogspot.com/2007/03/mathematics-anxiety.html.
[7] The News Today (August 27, 2012). "ICCC prof talks about Math Anxiety."

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