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Research Article

EARLY AND RECURRING EXPERIENCES & STUDENTS' ATTITUDES AND ANXIETY TOWARDS GENERAL MATHEMATICS

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Abstract

This study is descriptive research, which attempted to look into the mathematical experiences and perceptions of 100 senior high students enrolled in General Mathematics at Holy Name University, academic year 2018-2019. Journals written by the respondents based on pointers culled from a mathography and utilized the modified attitude survey questionnaires. The random sampling was used, by sending questionnaires to the selected senior high students who enrolled general math subject. The researcher sought permission from the person-in-authority to administer the questionnaire and thematic analysis and descriptive statistics were utilized by the researchers. Findings revealed that mathematics is a big frustration, but a great challenge to the students. They confirmed that their achievement in mathematics is affected by their attitudes and anxiety. They indicated that teachers who can feel for them and shows relevance of their lessons to everyday life though varied teaching approaches make mathematics learning nice and easy. It was discovered that majority of the students received their initial counting lessons from their parents, found educational shows and study materials beneficial for learning, favoured addition over subtraction - citing its ease and simplicity. Moreover, the results indicated that there is a moderately negative relationship between anxiety and attitude towards mathematics. If their attitude towards mathematics is positive, most likely the students enjoy performing the task and have low level of anxiety. A negative attitude towards mathematics causes them to dislike the task and have high level of math anxiety. Thus attitude, part of a students' disposition, influence the level of mathematics anxiety. Students who suffer mathematics anxiety usually failed in any mathematics situation. Findings suggest that teachers, including their personal characteristics, teaching styles and feedbacking, play a crucial role in the mathematics learning process. Their approach to providing opportunities, evaluation, reflection, and assigning follow-up activities significantly influence students' experiences and perceptions of mathematics.

Keywords: Early and Recurring Experiences; Anxiety; Attitudes; General Mathematics.

INTRODUCTION

Mathematics plays a significant role in daily life and technological advancements. However, only a few individuals truly appreciate the subject, while some students dislike, fear, or even hate it. Despite its importance, mathematics is met with negativity. It is crucial to revisit students' early experiences with math, their attitudes, and math anxiety to ensure that high schools, colleges, and universities produce graduates who are well-prepared for the real world. This study aims to support students and teachers in strengthening their understanding, interest, and appreciation of mathematics among 21st-century learners by addressing attitudes and anxiety associated with the subject and providing appropriate solutions.

LITERATURE REVIEW

The K to 12 Basic Education Program, introduced in the Philippines in 2012, is a significant educational reform aimed at improving the quality of basic education. It addresses the need to decongest and enhance basic competencies, extending the education cycle from kindergarten to year 12. This program, known as the "Enhanced Basic Education Act of 2013" or Republic Act 10533, not only adds two years to basic education and emphasizes universal kindergarten but also provides standards and guidelines for the curriculum development by the Department of Education (DepEd).

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Numerous studies have consistently shown that students with positive attitudes towards mathematics tend to dedicate more time to studying the subject, actively engage in mathematical activities, and achieve better results. Conversely, negative attitudes hinder and impede learning. McLeod (1991) argued that genuine learning can only occur when students possess positive attitudes, perceptions, and confidence in their mathematical abilities. Mathography, as highlighted by Ashcraft (2009), serves as a reflection of oneself and personal experiences in mathematics. Individuals with high levels of math anxiety tend to avoid math, leading to a decrease in their math competence and limiting their career options. Betz's study (1978) on math anxiety among college students revealed that it is prevalent, particularly among women and those with inadequate high school math backgrounds. Higher levels of math anxiety were associated with lower math achievement, increased test anxiety, and higher trait anxiety. Newman and Schwager (1993) emphasized the connection between attitude towards course content and mathematical achievement. Students who enjoy mathematics tend to work harder and achieve more than those who dislike the subject. Kloosterman and Cougan (1994) supported this finding, stating that students with favorable attitudes towards educational lessons perform better. Teaching methodology, as stressed by Jackson and Leffingwell (1999), also plays a crucial role in shaping attitudes towards mathematics. Hiebert and Carpenter (1992) proposed a constructivist framework for understanding mathematics, highlighting the importance of both external and internal representations of mathematical ideas. Effective communication of mathematical concepts requires external representations such as language, symbols, drawings, or

physical objects. This facilitates the appreciation of the precise language of mathematics and allows students to express their ideas and comprehend the nuanced meanings. Feelings of tension, frustration, and helplessness when dealing with numbers and mathematical problems contribute to math anxiety. Suinn and Richardson (1992) described math anxiety as an emotional reaction triggered by negative experiences with teachers, tutors, peers, and family members, often stemming from misconceptions and negative attitudes towards mathematics.

Objectives of the Study

This study aims to gather the respondent's early and recurring experiences and perceptions towards mathematics and describe how these affects in their present attitudes and anxiety in mathematics.

METHODOLOGY

A qualitative and quantitative survey design was employed in this study. The researcher attempted to determine the early and recurring experiences; the attitude and anxiety of students towards Generals Mathematics of the Grade 11 students of Holy Name University taking an academic track specifically the strand, Science, Technology, Engineering, and Mathematic (STEM) who enrolled general mathematics in school year 2018-2019. This research utilized the survey method on the student's perception on anxiety and attitude towards General Mathematics and validated through Focus Group interview (FGD) culled from a Mathography guide questions. These two methods were intended to gather their early and recurring experiences and perceptions towards mathematics. It utilized thematic analysis in interpreting and analysing the data. The data gathered from the survey were analysed individually and statistically treated, analysed and interpreted. The researcher also sought permission from the person-in-authority to administer the questionnaire and undergo the ethical review.

RESULTS AND DISCUSSION

The study analysed students' response using their "Mathography" autobiographies to identify consistent patterns and perspectives. The derived qualitative themes revolve around the complexity of mathematics, the impact of mathematics education, prior knowledge and perception, and emotional relationships with mathematics. Two main themes emerged: "Early Experiences and Influences with mathematics" and "The Significance of Studying Math." These themes provide insights into students' personal journeys, highlighting the importance of early experiences, external influences, and the value attributed to studying mathematics. Theme 1: Early Experiences and Influences with Mathematics: Among the surveyed students, 70% received their initial counting lessons from their parents, while only 30% acquired this knowledge in school. A significant majority 57% found educational shows and study materials like baby books, flashcards, and social media applications like You Tube videos beneficial for learning. In terms of counting methods, 31% mentioned their parents teaching them to count using their fingers. Furthermore, approximately 17% shared experiences of early mathematical achievements, including awards and participations in competitions. Merely 5% reported being motivated by parental rewards for academic performance, while 21% expressed hesitancy in displaying their skills due to the fear of embarrassment. Interesting, 5% indicated that their parents actively encouraged them to showcase their abilities. Conversely, 23% confidently demonstrated their skills to classmates while 34% opted not to exhibit their talents to others. In terms of their preferences, 63% of the respondents favored addition over subtraction, citing its ease and simplicity. They found subtraction more challenging, especially when it involved fractions and borrowing a number from a larger subtrahend. Only 7% of the students expressed a preference for subtraction, while 3% perceived no significant difference between the two operations. When it comes to techniques used for adding and subtracting, 59% of the respondents relied on counting with their fingers as their primary "trick" or method. Fourteen percent stated that they had no specific techniques for these operations. On the other hand, 16% highlighted the usefulness of visual aids like flash card and other math applications, finding them helpful in making addition and other math operations easier and more comprehensible.

Theme 2: The Significance of Studying Math: Despite the common belief that the respondents confined mathematics to the classroom, they genuinely recognize the significance, role, and value of mathematics in their everyday lives. Thirteen percent of the students credit mathematics for helping them become more analytical and meticulous individuals. Additionally, twenty-five percent of the students observe that mathematics has practical applications both inside and outside the classroom. Thirty percent use mathematics in everyday transactions such as budgeting for expenses, while 23% utilize mathematical knowledge for managing their daily schedule through time management.

Theme 3: Emotional Relationship with Mathematics: A significant finding from the study reveals that 42% of the students expressed their enjoyment of mathematics during elementary years due to the effectiveness of their teachers. These students attributed their fondness for the subject to the proficiency and skills of their teachers in delivering math lessons. Furthermore, 38% of the students noted that the casual and practical approach to presenting mathematics made it easier for them to understand the concepts. On the other hand,11% of the respondents reported early disinterest in mathematics, which they attributed to having strict and biased teachers.

Furthermore, some expressed their peak years in journeying mathematics. 57% of the respondents indicated that their elementary years were the most successful, while 37% mentioned high school as their peak performance period. Only 3% considered college as their" best math year." Among those who regarded their elementary and high school years as the approachable, efficient, and patient, contributing to their understanding and academic achievement. However, 16% of the students recalled struggling as early as their elementary years, while 46% identified their high school years as the most challenging period. Among those who experiences difficulties, 29% attributed it to ineffective, boring, biased, and fast-paced teaching styles. When it comes to expressing their perceptions about math, 36% of the respondents stated that they are more likely to discuss their negative experiences and difficulties in group discussion with friends. Meanwhile, 29% would engage in conversations about teaching styles and inefficiencies of their professors. Additionally, 16% mentioned that they would

simply laugh at the simplicity of math, while 19% expressed their willingness to talk about mathematics and the challenges it poses to students.

Theme 4: Mathematics Complexity: In the study, a consistent finding among 46% of respondents was the recognition that mathematics becomes more complex as they progress in their education. Additionally, 35% of the students viewed due to below-average grades, affecting their perception of mathematics. Students attributed their negative image of math prior knowledge and perception of teachers. Regardless of their personal preferences, most students acknowledged the role and importance of mathematics in their lives. Beyond the four basic operations, 28% mentioned the significance of addition and subtraction in time budgeting, 29% in fund allocation, and 41% in demanding the correct change. Among the respondents, 33% claimed mathematics as their favorite subject, with 42% finding it easy and 49% enjoying the challenges it presented. Conversely, 78% did not consider mathematics their favorite subject, with 17% expressing strong dislike for it. Difficulty in the subject was cited by 85%, negative experiences with teachers, 9% held a neutral stance towards mathematics.

Regarding gender perceptions, 34% believed there was no specific gender group that excelled in mathematics. Meanwhile, 52% attributed performance in mathematics to effort invested in studying, and 5% believed that girls were more likely to show interest and perform better due to their dedication. Only 9% believed men were better and faced greater challenges in mathematics. When seeking help, 29% preferred consulting parents or family members, while 15% found in receiving inspirational and motivational talks from their parents. Teachers and tutors were mentioned by 24% as helpful in clarifying uncertainties, while 27% turned to peers for assistance when facing difficulties in mathematics.

Theme 5: Impact of Mathematics Education: In terms of the teacher's role in mathematics learning, 23% of the students mentioned opportunities provided by teachers to formulate generalizations and conclusions. Additionally, 16% highlighted the importance of teachers allowing students to evaluate their own output. Another 15% emphasized the significance of teachers giving their own output. Another 15% emphasized the significant of teachers giving them a chance to reflect on the lesson. Furthermore, 49% of students acknowledge the value of assignments tasks given by teachers to follow up on the lesson and giving of appropriate feedback. From the overall discussion, it becomes clear that the students had mixed feelings about mathematics. The findings suggest that teachers, including their personal characteristics, teaching styles and feedbacking, play a crucial role in the mathematics learning process. Their approach to providing opportunities, evaluation, reflection, and assigning follow-up activities significantly influence students' experiences and perceptions of mathematics.

For the Mathematics anxiety survey, the overall weighted mean is 3.7 which means the students very often experienced math anxiety. Specifically, during math tests, they found herself comparing others progress. They were worried of not to do well in math test and not able to get a high grade. During study period for a math test, the student showing anxious behavior (fidgeting, pacing, making excuses, avoiding the situation). Some students felt that they understand certain math concepts in class but do poorly on tests. They need to prepare much more for math tests than for other subjects. Some also expressed that their parents and friends shared their own struggles and frustrations with math. Others said they do not feel confident when taking math tests no matter how much they study.

Furthermore, the results of the Mathematics Attitudes survey, the overall weighted mean of 3.9 which implies they experiences and agreement on the following attitude. The students try to learn mathematics because it helps develop their minds and helps think more clearly in general. Mathematics is needed in designing practically everything. Students who have understood mathematics they have studied will be able to solve any assigned problem in five minutes or less. Using the web (or computer) is a good way for them to learn mathematics. They were interested and willing to acquire further knowledge of mathematics. They said real mathematics problems can be solved by common sense instead of the mathematical rules they've learn in school. But some students highlighted that ordinary students cannot expect to understand mathematics, they expect simply to memorize it and apply what they have learned mechanically without understanding. Only few students said mathematics is enjoyable and stimulating.

For the association between the mathematics attitude and anxiety. Using alpha of 0.05, the computed correlation R-value of -0.384 which indicates there is a moderately negative relationship between anxiety and attitude level towards General mathematics. This implies, if their attitude is positive, they will most likely enjoy performing the task and have low level of anxiety. A negative attitude towards mathematics will causes them to dislike the task and you have high level of math anxiety. This implies the attitude is part of a students' disposition that influence the level of mathematics anxiety. Students who suffer mathematics anxiety have accepted that they fail in any mathematics situation.

Conclusion

Mathematics can be learned although some people take longer time in doing it, while others are gifted with faster comprehension skill. Students see their skills as something spontaneous, easy and almost natural and that mathematics will always be a challenge. Findings revealed that mathematics is a real big frustration, but a great challenge to the students. They confirmed that their achievement in mathematics is very much affected by their attitudes and anxiety. They indicated that teachers who can feel for them and show the relevance and connection of their lessons to everyday life though varied teaching approaches make mathematics learning nice and easy. The study also revealed that there is a significant relationship between anxiety and attitude towards learning mathematics. Results indicates that there is a moderately negative relationship between anxiety and attitude level toward mathematics. If their attitude is positive towards math, the students most likely enjoy performing the task and have low level of anxiety. While a negative attitude towards mathematics will causes them to dislike the task and have high level of math anxiety. Thus attitude, part of a students' disposition, influence the level of mathematics anxiety. Findings suggest that teachers, including their personal characteristics, teaching styles and feedbacking, play a crucial role in the mathematics learning process. Their approach to providing opportunities, evaluation, reflection, and assigning

follow-up activities significantly influence students' experiences and perceptions of mathematics.

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