

Exploring the Students' Struggles in Learning Mathematics: Basis for Enhancement

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Abstract— Mathematics is considered a difficult course as students are struggling to learn. This study explored the students' struggles in learning Mathematics at a teacher education institution in the province of Misamis Occidental during the second semester of S.Y. 2022-2023. This study utilized a qualitative approach using phenomenological design. The study participants included 30 students enrolled in a course, Mathematics in the Modern World (Math I), and were selected through purposive sampling. Using Seidman's phenomenological data analysis technique, the researchers used a researcher-made interview guide to elicit data from the participants. Results revealed eight themes: 1) Having Difficulty in Math Comprehension; 2) Viewing Math as a Difficult Subject; 3) Having Poor Performance in Math; 4) Lack of Basic Foundation in Math; 5) Having Ineffective Teaching; 6) Having Negative Attitude Towards Math; 7) Lacking Interest in Math; and 8) Longing for Math Enhancement. Students struggle to learn Math due to various factors that hinder their comprehension and performance. Teachers and students explore the effectiveness of hands-on and interactive activities, such as manipulatives, educational games, and interactive technologies, in enhancing the enjoyment and comprehension of abstract concepts. An enhancement program addressing students' struggles in Math is recommended.

Keywords— difficult subject, difficulty and struggles, learning, Math comprehension, Math enhancement, Mathematics, poor performance.

I. INTRODUCTION

The Mathematics Assessment of the Programme for International Student Assessment (PISA) indicated that more than half of Filipino children performed poorly, with scores below the lowest proficiency level. As indicated, the Philippines ranks second lowest among the 79 participating countries in Mathematics literacy. The commonality of Math makes it a requirement for higher education (Hwang et al., 2021). Making Mathematics easy for students is one of a teacher's most difficult challenges. Since Mathematics is taught at a higher level in higher education than in secondary and elementary schools, increasing numbers of students struggle with it in higher education. Hence, the causes that contribute to these students' struggles in learning Mathematics are the three themes: the teacher's delivery of instruction, learners' abilities and experiences, and the school environment and facilities for learning (Langoban, 2020). Elements, including students' attitudes toward the subject, teachers' teaching strategies, and the learning environment at school, influence how well children learn and succeed in Mathematics (Mazana et al., 2019).

Mathematics in the Modern World (Math I) is an undergraduate General Education course intended to aid students in appreciating Mathematics. The goal of the course is for the students to recognize the importance

and relevance of Math in all sectors of human endeavor. It has an impact on both teachers and students (Verdeflor et al., 2021). One of the general education disciplines covered under the new college curriculum in the Philippines is Mathematics in the Modern World, and students have a greater level of proficiency in the MITMW competencies, such as knowledge, values, and skills (Roman & Villanueva, 2019). However, many students arrive at college with preconceptions and approaches to Mathematics that disadvantage their learning (Boaler et al., 2021).

Moreover, Mathematics is one of the most difficult subjects for Filipino learners. They had a passive stance toward Mathematics regarding their self-confidence, satisfaction, and encouragement. Therefore, their attitudes and study habits significantly impact their Mathematical performances (Capuno et al., 2019). In addition, high school students encounter Mathematical difficulties (Guner, 2021).

There are issues and drawbacks in teaching and learning Mathematics that students need help overcoming. Poor study habits, low academic achievement attitudes, school environment factors, emotional problems, and financial difficulties were the five factors influencing the failure rate in Mathematics (Casinillo, 2019).

Furthermore, examining instructors' attitudes toward student struggle when students learn Mathematics in remote learning settings instead of classroom settings was one of the study's goals on the role of productive struggle in promoting student learning of Mathematics at all levels. Teachers felt that students' challenges were more valuable in classroom-based settings than in remote learning environments. Parent's disapproval of struggle in Mathematics learning, a lack of social relations and peer-to-peer cooperation, difficulties accessing learning materials, and a need for a teacher-facilitated learning environment are the four premises that explain why teachers see attempts to support productive struggle in a remote learning setting as potentially problematic (Russo et al., 2021). Many students might fear or dislike advanced Mathematics throughout the learning process, resulting in learning difficulties. (Liu et al., 2020).

Many community college students struggle with the crippling issue of Math phobia (Samuel & Warner, 2021). Mathematics anxiety is common in classes where students are afraid of the subject.

Thus, peer behaviors like poor students causing trouble and intelligent students dominating the lesson and speech, such as making dreadful and discouraging statements in the Mathematics classroom, directly affect the intensity of Mathematics anxiety (Garbaet al., 2020). Math anxiety (M.A.) has been linked to decreased student Mathematics performance (Kong & Zhang, 2019).

Low Mathematics ability and poor working memory are the student's MLD (Mathematics Learning Disabilities) diagnostic criteria (Hobri et al., 2019). Many students perform below the expected level in Mathematics, lose interest in the subject, and stop trying to learn it (Yeh et al., 2019). Today, Mathematics is overvalued, which has negative effects.

The overvaluation of Mathematics results in the wastage of intellectual resources in the workforce, aids in perpetuating social inequality, fosters negative attitudes and low self-esteem toward Mathematics, and, for some, restricts their ability to participate in their democratic society fully. Mathematics is overrated in contemporary society, which has negative effects (Ernest, 2020). The underachievement of students in Mathematics is a major concern for many nations worldwide (Chand et al., 2021).

Mathematics in the Modern World (Math I) has recently been part of the tertiary-level curriculum. Many have studied the difficulties of learning Mathematics in general, but only a few studies have focused on this specific Math course. To fill this gap, it is necessary to understand why students struggle to learn Mathematics in the Modern World. Hence, this study is important to examine the challenges of the teaching-learning process in Math I. Since students had poor performances and lacked the enthusiasm to learn Mathematics, the researchers would like to identify their struggles in learning Math I at the tertiary level of Misamis Occidental.

Statements of the Problem

This study explored the students' struggles in learning Mathematics. It specifically aimed to respond to the following questions:

1. What factors influenced the Education students to struggle in learning Math?
2. What is the lifeworld of Educations students who struggle in learning Math?
3. How do Education students who struggled in Math view themselves in the future?

II. METHODS

A. Research Design

This qualitative study used a phenomenological design. It is an investigation in which the essence of human experiences of a phenomenon as described by participants is determined (Creswell, 2009). This concentrated on what people experience and how they experience it. The goal is to identify the significance of the shared experience that lies beneath all the variations in this specific learning experience (Patton, 1990). The phenomenological design was deemed appropriate as the researchers explored and identified the struggles encountered by students in learning Mathematics in the Modern World (Math I).

B. Research Setting

The study was conducted at a teacher education institution in the province of Misamis Occidental. It was one of the first courses provided by the institution and is the region's leading center of teacher education. The Bachelor of Science in Education (BSE) received full government recognition in 1949. The government approved the Bachelor of Science in Elementary Education (BSEEd) and the Two-Year Junior Normal Home Economics Course four years after they were first offered. The Education, Liberal Arts, and Commerce

programs were submitted to the Philippine Association of Colleges and Universities Commission on Accreditation (PACUCOA) for voluntary accreditation as the institution sought to offer high-quality academic programs. In 1988 and 1990, the education program achieved Level I and II accreditation. The Level III programs for the Bachelor of Elementary Education (BEE) and Bachelor of Secondary Education (BSEd) were reaccredited by PACUCOA in 2011; this accreditation is valid until November 2014.

One of the teacher education institution's program outcomes highlighted the significance of providing students with numeracy, which pertains to the expertise, abilities, behaviors, and attitudes required for using Math concepts in various circumstances. It entails understanding and acknowledging Mathematics' role in the world and having the views and capabilities to use Mathematical understanding and abilities meaningfully, notably in today's modern world.

C. Participants of the Study

The participants of the study were 30 Education students at the tertiary level in Misamis Occidental who were selected through purposive sampling. The following criteria were used for selecting participants: students enrolled in a general education course, Mathematics in the Modern World (Math I) S.Y. 2022–2023; students with a midterm grade of 2.5 or below; and students willing to participate. The researchers ensured that the mentioned criteria were fulfilled before conducting the interviews.

D. Instruments

Researchers used a researcher-made interview guide to gather data from the participants using the structured interview guide (Appendix A), which the thesis committee approved. The interview guide included an opening question, a core question, and an exit question that focused on exploring the students' struggles in learning Mathematics. There were three interview questions for the opening research question, six for the core research question, and one for the exit research question. Experts thoroughly checked the questions to confirm validity.

E. Data Collection

The researchers asked permission first from the College of Education dean before conducting the study. Then, requested approval from the chairman of BSED-Mathematics, as the study focused on the said course. Once the permit was approved, the researchers informed

the research instructor, prepared a consent letter for the participants, and explained the purpose of the study. They conducted 15 face-to-face interviews; subsequent dialogues were audio recorded, and 15 participants filled out the Google Form with follow-up questions. The information gathered was treated with confidentiality. The researchers retrieved, transcribed, and analyzed the participants' responses using the HyperRESEARCH software to generate codes, grouped the codes into themes, and interpreted the results.

F. Ethical Considerations

The subjects' informed consent was obtained by the study's ethical standards and acquired before the interview. The researchers informed the participants about the Data Privacy Act of 2012 to ensure accountability for sharing their personal information. Participants were told the study's goals, the possible value to them and others, the confidentiality of the data, and the anonymity of the study's participants. Researchers reassured participants that their interview questions were open-ended so that they could respond positively or negatively at any moment. The participants can withdraw their responses anytime without fear and harm.

Interviews were done by setting aside potential prejudice from the researchers. Incorrect advice, coaching, and incorrect interpretation of original data were also prevented. Completed conversations with the study were conducted with complete honesty and integrity.

G. Data Analysis

The data was investigated using Seidman's Phenomenological data analysis technique of wholistic reading, selective or highlighting approach, detailed or line-by-line approach according, and analyzing data by themes. The results and concepts from the study were incorporated into the analysis.

Wholistic reading is the technique of capturing the text's phenomenological meaning and fundamental importance.

Selective or highlighting approach determines what statement or phrase seems important or revealing about the described phenomenon or experience.

Detailed or line-by-line approach or coding is the stage to discover the described phenomenon or experience.

Analyzing data by themes is the final phase through arranging the themes according to the fundamental elements of a lifeworld, creating a specific structure of the meaning of the lived experience.

III. RESULTS AND DISCUSSIONS

This qualitative study explored students' struggles in learning Math at a teacher education institution in the province of Misamis Occidental. The participants were 30 students comprised of twenty-four (24) females and six (6) males, ages 18–31, who were enrolled in the course, Mathematics in the Modern World (Math 1) for the academic year 2022–2023. The high schools that the participants mostly went to were public schools.

The researcher used descriptions of the participants' important meanings in search of emerging themes. Eight main themes emerged in analyzing the data, revealing the participants' struggles in learning Math. These themes involved: 1) Viewing Math as a Difficult Subject; 2) Lack of Basic Foundation in Math; 3) Lacking Interest in Math; 4) Experiencing Ineffective Teaching; 5) Having Difficulty in Math Comprehension; 6) Having Poor Performance in Math; 7) Having Negative Attitude Towards Math; and 8) Longing for Math Enhancement

A. Factors Influenced the Students' Struggles in Learning Math

Four themes emerged showing the factors that influenced the students' struggles in learning Math, namely: viewing Math as a difficult subject, lack of basic foundation in Math, lacking interest in Math, and experiencing ineffective teaching.

Viewing Math as a Difficult Subject

Viewing Math as a difficult subject denotes the perception or belief that Mathematics is inherently challenging, complex, or hard to comprehend. It is a mindset or attitude that students hold, considering Math to be a subject that requires exceptional intelligence or innate talent to grasp. Three subthemes appeared for viewing Math as a Difficult Subject: (1) Hard to Learn subject; (2) Experienced Struggle; and (3) Challenging Subject.

Hard to Learn Subject. One of the reasons Math is considered difficult is the prevalence of generalizing it as a hard subject. Students generalized that there was no easy way in Mathematics. Math is indeed a very hard subject to pass and learn. In this regard, students

believed Math could only be learned slowly. Participants mentioned these lines 2 and 28.

"I struggled with all the lessons in Math since I was in my Grade 7 until now. For me, there is no easy in Mathematics." (P2)

"Math is a very hard subject - hard to pass and hard to learn." (P2)

"Math cannot be learned quickly." (P28)

Experienced Struggle. Students struggled in this course as it involved various complex equations. The struggle is real, and the level of complexity in Math increases as the lessons get harder and harder. These were uttered by participants 9 and 22.

"Math means struggle is real." (P9)

"Since Grade 6 until now, the lessons in Math are getting harder." (P22)

Challenging Subject. In addition, students viewed Math as challenging as it involved abstract concepts and calculations that require logical reasoning and problem-solving skills. Participant 25 supported this claim.

"I find Math challenging because it involves abstract concepts, complex calculations, and requires logical reasoning and problem-solving skills." (P25)

Many students find Math difficult (Heyder, 2020). Mathematics is recognized as one of the most difficult areas for Filipino students (Capuno et al., 2019). One of the concerns among teachers, students, and their families revolves around the discrepancy in the ease of learning Mathematics. While some students grasp Mathematical concepts effortlessly, others face difficulties in understanding and mastering them (Kiarsi & Ebrahimi, 2021). Math is a difficult subject for many upper middle-school students. The study highlighted a need for more effective use of strategies focused on comprehension towards the end of middle school. This suggests an increased emphasis on teaching and discussing these learning strategies to address this deficiency (Putri et al., 2020).

Lack of Basic Foundation in Math

Students with poor comprehension of fundamental arithmetic ideas and abilities may need help

comprehending and thriving in more complex Math courses. It is a problem that can develop at any level of education, from primary school through higher education and beyond. Five subthemes showed the lack of foundation in Math: (1) Mismatch between Discussion and Quiz; (2) Copying the Answer Key in the Module; (3) No Prior Knowledge; (4) Difficulty in Answering Word Problems; (5) Poor Understanding on Math Topics.

Mismatch Between Discussion and Quiz. There needed to be more alignment between the topic of the discussion and the subsequent quiz or assessment. The topic the teacher discussed was easier than the given Mathematical problem. Subsequently, a student concluded the difference between the discussion and its application. Participant 1 proved this claim:

“When I was in Grade 9. One time, the discussion was quite simple, and the topic was very understandable. However, when the teacher gave a quiz on that topic, it was difficult for me to use the formula. I conclude that the given problem in our quiz was not compatible with the formula and example given because it was exceedingly difficult, and I cannot solve the problem.” (P1)

Copying the Answer Key in the Module. Students experienced a variety of obstacles during the epidemic, including learning Math, as they transitioned to the "new normal" of online education. Some students resorted to copying answers rather than understanding the underlying concepts due to a lack of face-to-face interaction and an increased reliance on modules and answer keys. Participant 1 expressed this statement:

“During my Senior High School, Grade 11, and Grade 12. I have belonged to a modular setup for these two years since I could not get vaccinated. So, it was difficult for me to learn Math, especially since we had a Calculus subject then. I do not remember what I answered in my modules during those years. I did not learn something and just answered Math, copying what was in the Module. For example, in the questions in the pretest and posttest, there was an answer key at the back, and I just wrote it all. Therefore, I did not learn something during those years.” (P1)

No Prior Knowledge. Students faced the issue of missing prior knowledge in particular topics because they had yet to be exposed to such Mathematical

concepts before and the adjustment of a modular class setup. Besides, their learning style did not correspond to the instructional techniques used by their teachers. Participants 11 and 18 supported this claim:

“During the second semester of the academic year. I was surprised with the lessons. Maybe I have encountered it way back in Senior High School. But it was different since we have a modular setup.” (P11)

“Now in college, my learning style did not fit teacher's teaching methods, and I have no prior knowledge to such topics as I did not meet those concepts before.” (P18)

Difficulty in Answering Word Problems. Solving word problems has been a challenging task for students since elementary. Participant 19 emphasized this:

“The first time I realized I had difficulty in learning Math was when I was in elementary. I had a tough time answering some word problems.” (P19)

Poor Understanding of Math Topics. Lastly, students became aware of their Math difficulties, particularly with concepts such as integers and fractions. They also needed help with trigonometry in Junior High, particularly grasping the links between cosine and sine, as well as the applications of trigonometric functions. This helped them realize the importance of grasping basic arithmetic equations before moving on to more difficult topics. Additionally, they did not know how to divide in primary school, showing continued arithmetic difficulty throughout their career. The responses of the participants stress this:

“The first time I realized I had difficulty in Math was in high school. Integers and fractions were the topics in high school that I found very difficult.” (P21)

“Back in junior high school where trigonometry was introduced, and then I remember that I had a hard time figuring out the relationship of cosine and sin, the law of cosine when to use the sin, cosine, tangent, cotangent secant, cosecant.” (24)

“I realized that it is hard to learn Mathematics if you do not learn the basic Math equation first.” (P28)

“I struggled a lot in Math when I was in my elementary; I do not know how to divide.” (P29)

Word problems are among the most challenging problems that Math students face. As a result, they have been the subject of a great deal of research during the last 50 years. Word problems are exercises in complicated problem-solving that require cognitive (heuristic) and metacognitive (or self-regulatory) methods. Furthermore, word problem-solving performance is highly related to various general cognitive resources, including working memory capacity and inhibitory abilities (Verschaffel, 2020).

They were studying the impact of aligning discussion topics and quizzes, exploring interventions to discourage copying answers from modules, investigating strategies to bridge the gap for students with no prior knowledge, examining instructional methods to improve performance in word problems, and researching approaches to enhance understanding of Math topics through visualization, hands-on activities, and analytic thinking. This help to find effective instructional techniques and interventions to help students establish a solid Mathematical foundation.

Lacking Interest in Math

Students needed more interest in Math. Thus, it assesses the students to hate the subject, not exert an effort, and feel lazy to learn. Students claimed that learning Math was challenging when they had no interest in learning. Some students also considered Math an annoying and boring subject. The claim was supported by participants 3, 4, 15, and 23:

“Learning Math is not easy at all, especially when I do not like it.” (P3)

“I admit to myself that half of it was my fault. I do not have the effort, passion, and motivation to love learning Math.” (P4)

“Sometimes I can say that Math is very annoying. Also, I cannot understand well in Math, unlike the other subjects.” (P15)

“I just do not like this subject because it is difficult, and then the numbers are very boring to look at.” (P23)

“I am a lazy person who does not have interest in the subject, Math.” (P23)

This finding stems from the issue of students’ lack of interest in Math. Most students dislike Math because it

is difficult to grasp and tedious to learn (Firdausy et al., 2023). Many students may fall further behind in their Mathematics achievement and lose interest in Mathematics, finally giving up learning Mathematics (Yeh et al., 2019).

When students lose interest in Math, it is critical to utilize tactics that can rekindle them interest and engagement with the subject. Teachers can make Math more relevant by using real-world examples and applications. Students are more likely to develop a real interest in Math if they perceive how, it is relevant to their daily life. Second, hands-on and interactive activities can increase enjoyment and engagement in Math. Students can better comprehend abstract concepts using manipulatives, educational games, and interactive technologies. Lastly, giving students options and autonomy in their learning might boost their motivation.

Experiencing Ineffective Teaching

One of the challenges linked to students’ struggles in learning Math is ineffective teaching. Thus, students cannot understand Mathematical concepts, as their conceptual understanding, problem-solving abilities, and overall engagement are hampered by rapid teaching speed. Three subthemes emerged in the quest for ineffective teaching: (1) Teaching in a Fast Manner; and (2) Limited Engagement in Teaching.

Teaching in a Fast Manner. It was a common concern of the students during their discussion in Math. As a result, students need help to understand the lessons efficiently. Some students stated that the teacher was teaching quickly, wherein they were grappling with a step-by-step discussion. Furthermore, the students wanted clarification of the discussion before proceeding to another. Participants 4 and 25 attest to this claim:

“The way that my teachers deliver the lessons, they taught it in a fast manner. Me as a slow learner, I find it hard to understand. It should be a step-by-step process.” (P4)

“Teachers proceed to the next topic without making sure if all their students understood the lesson.” (P25)

Limited Engagement in Teaching. Students were grappling with the teacher’s efficient way of delivering the lesson. A lack of collaborative learning between teachers and students hampered their capacity to comprehend Mathematical concepts. The students

attested that Math was considered the most difficult subject, but the teacher's delivery of the lesson matters. The lines of the participants supported these:

"Math is the most difficult subject. But it also depends on the way that the teacher delivers the lesson." (P16)

"It was when I was in Senior High School, it was so hard for me because it was all modules, and I needed a teacher to teach and explain the lessons for me." (P26)

One of the major threads of Mathematical proficiency is the constructive disposition of teachers. The study findings also indicate that the interconnection of teacher core disposition and positional **situatedness** may aid in understanding and solving the complexity of teaching and learning in the Mathematics classroom (Lynch-Arroyo et al., 2023). Teachers rarely employed tactics like connecting concepts, integrating previous information, and using real-world examples. Over half of teachers' concept development strategies failed to enhance students' higher-order thinking.

Educators can overcome the problem of teaching rapidly in a variety of ways. Teachers should use a differentiated approach that considers pupils' unique learning requirements. Additional resources and support materials, such as handouts or visual aids, might help students who need more time to understand subjects. Teachers should create an environment in which questions and conversations are encouraged, allowing them to assess understanding and change their pace, accordingly, ensuring that all students can keep up with the lecture.

B. Lifeworld of Students Who Struggle in Learning Math

Three themes emerged depicting the lifeworld of students who struggle in learning Math specifically: having difficulty in Math comprehension, having poor performance in Math, and having a negative attitude towards Math.

Having Difficulty in Math Comprehension

Math comprehension issues relate to students' challenges when attempting to learn and master Mathematical topics. It includes their troubles, hurdles, and disappointments in grasping and solving arithmetic issues. Math comprehension issues can express themselves at numerous levels, ranging from fundamental arithmetic to more sophisticated

Mathematical concepts such as algebra, calculus, or statistics. Some students may struggle with simple arithmetic operations, while others struggle with abstract notions or applying Mathematical principles to real-world problems. Three subthemes emerged in the quest for having difficulty in Math comprehension: (1) Lack of Understanding in the Discussion; (2) Lack of Understanding in Math; (3) Short-Term Memory.

Lack of Understanding in the Discussion. A lack of understanding among participants can hinder the effectiveness and productivity of such discussions. Students were slow learners and needed to be more intelligent to have the foundational knowledge required to grasp complex Mathematical problems, leading to a lack of understanding during discussions. The following participants expressed their struggles:

"The first time I realized that I had difficulty in learning Math was in my Grade 7. I do not understand the teacher's discussion, and I am a slow learner when it comes to this course." (P2)

"I cannot easily learn Math discussion since I am not logically intelligent to understand Mathematical problems." (P9)

Lack of Understanding in Math. Students needed to help understand Mathematical concepts, specifically the letters x and y in Math. The formulas were new and hard to absorb; students needed to discuss the topic repeatedly to understand the topic. So, once they were given a certain Math problem, they started struggling to answer it. The following participants supported this claim:

"I struggle understanding the letters like x and y in Math." (P29)

"The difficulty of the formula was new to me and hard to understand." (P18)

"I realized that I do not understand Math if no one will explain it to me multiple times." (P19)

"The teacher discussed the topic, and I thought that it was easy, and I could answer it confidently, but it turns out that my understanding is still insufficient because I had struggled to answer the given problem." (P7)

Short-Term Memory. Students had short-term memory when it came to Math; they easily forgot the discussions and needed help remembering what and how the teacher solved such problems. Thus, they needed to learn how to start solving a given Math problem and the steps involved in answering it. The lines of the participants supported this:

"I forgot easily. After the discussion, I cannot recall what or how did my teacher solve it." (P10)

"I forgot and do not know how to start solving the given Math problem." (16)

"When I was in Junior high when my teacher gave us a quiz on word problems, and I had struggles in answering it. I easily forgot the steps in answering the questions." (P26)

Students' low comprehensive skills in understanding Mathematical topics are associated with relations and functions (Kikas et al., 2020). Many students face troublesome deviations in Mathematics comprehension difficulties (Doabler et al., 2021). Math sense is a potent account that identifies the root problem of why most students struggle with Math comprehension. (Manchinis, 2019).

Active participation is essential to address a need for more understanding in Math discussions. Engage by asking questions, seeking clarification, and sharing thoughts to identify confusion and encourage explanations. Collaborating with peers through study groups or Math forums can provide diverse insights and fill knowledge gaps. When lacking understanding in Math overall, analyze the curriculum, focus on specific areas, and allocate extra time for studying and practicing. Break down complex concepts into manageable parts using visual aids and real-life examples. Regular practice is crucial for developing a solid understanding. For short-term memory in Math, chunk information, use mnemonic techniques, and regularly review and employ spaced repetition. Remember to seek assistance when needed, maintain a positive mindset, and persist in your learning journey.

Having Poor Performance in Math

Poor performance in Mathematics revolves around the struggles and difficulties students face when learning and applying Mathematical concepts. It encompasses a range of issues that cause a student's low achievement in

Math. Two subthemes appeared for students with poor Math performance: (1) Having a Hard Time Answering Math; (2) Got Low Scores in Math.

Having a Hard Time Answering Math. Students needed help answering Math. They struggled to solve every Math issue, which caused aggravation and slowed development. When the teacher held an oral recitation, they felt incapable of figuring out what to do and had no idea what to answer. Participants 18 and 23 confirmed this claim:

"There was a time my teacher conducted an oral recitation; if we could not answer the problem, we must stay standing until we got the correct answer. So, I stood for an hour as I did not know how to answer the given problem." (P18)

"When I was in Grade 8. I was told to answer in front, and I do not know what to answer, so I do not want to remember that incident." (P23)

Got Low Scores in Math. Students endured the burden of receiving low Math scores and grades, which caused difficulty with each arithmetic problem. They received zero and low scores on multiple quizzes, demonstrating a complete lack of knowledge in addressing arithmetic calculations, which resulted in almost getting failed grades. The responses of the participants stress this:

"I got a low score and grade, and I have a hard time solving every Math problem." (P2)

"I experienced that I got the lowest score in the Math class several times." (P3)

"I have a lot of worst experience in Math, I got zero scores where I got nothing in my brain on how to solve such Math equations." (P9)

"I almost got a failed grade in Math." (P9)

"I always got low scores in quizzes and exams." (P21)

Unreliable self-consciousness and poor academic performance have been observed to go hand in hand; students who exhibit cautious, distrustful, or timid behavior are at risk for poor academic performance. Several concepts have been put out as to the mechanism underlying this link, emphasizing that cautious and skeptical students have fewer learning chances and that

instructors and hindered students interact negatively more often (Jaana et al., 2020).

For students having trouble answering Math problems or obtaining bad grades, it is crucial to identify students' unique areas of difficulty and seek extra learning tools such as online platforms, tutorials, and textbooks. Break complicated issues into simpler pieces, practice regularly, and consider receiving assistance from tutors, professors, or classmates. To reinforce learning, analyze test results, revisit the subject, join study groups, and use internet resources. To enhance Math abilities and results, be optimistic, have a growth attitude, and build a consistent study habit.

Having Negative Attitude Toward Math

Students' learning has been influenced by having a negative attitude toward Math. As a result, it sheds difficulty as students lose self-efficacy upon dealing with Mathematical problems. Eight subthemes emerged in the pursuit for students having negative attitude towards Math: (1) Lack of Self-Confidence; (2) Feeling Unmotivated; (3) Feeling Alone; (4) Self-Blame; (5) Over thinking; (6) Self-Pity; (7) Feeling Ashamed in Answering Math; (8) Having Anxiety in Math.

Lack of Self-confidence. The students needed more self-confidence as they were tasked to solve different Mathematical problems. Hence, their low self-confidence impacts students' performance, the perspective of arithmetic, and overall well-being. Most students needed more confidence in their answers in any Math activity. Some of these students need more trust in their capabilities to solve Math problems and have no determination to study the subject. The claim was supported by participants 1 and 29:

"When I was one of the representatives in a Math Quiz Bee in Grade 10. I was not confident with my answer, and my colleagues kept pushing me to write it, but I insisted that I was not sure of it." (P1)

"I am always on the last list in volunteering to state our answer in each problem because of the lack of confidence of getting the correct answer." (P1)

"I lacked self-confidence, effort, and determination in studying Math." (P1)

"I think I know how to solve Math problems, but I do not have trust in myself." (P29)

Feeling Unmotivated. Some students needed more motivation to learn Math. Hence, it has a negative impact on students' effort, performance, and interest in the subject. In addition, Math made the student stop studying the lessons. Participant 8 supported the finding: *"Math is tiring as I lack knowledge, lost my confidence, skills, and ability to learn Math, and it makes me stop studying Math." (P8)*

Feeling Alone. Moreover, some students were feeling alone in learning Math, wherein this was a hindrance to their progress. Due to not collaborating with their peers, it affects students' performance and learning experiences. Similarly, some students cannot go along with their classmates since they cannot comprehend the Math lessons. Participants proved this claim:

"I feel like I am alone during our class discussion in Math and cannot go along with my classmates." (P1)

Self-Blame. With the struggles of students in learning Math, they acquired self-blaming. As a result, this paved the connection between their weakness and learning deficiency. The students said they were disappointed with their performance in Math. Also, some students were jealous of their peers since they could not easily solve the Math problems. Participants 1 and 5 upheld this statement:

"Sometimes, I am disappointed in myself because why can't I learn Math that easily, just like my classmates? Also, I feel jealous of them as they are easy-go-lucky in terms of Math and thinking of when I will be able to learn Math." (P1)

"It feels sad because in class I am the one who did not know how to solve the Math problems, but for my classmates, for them it is easy. I do not know why Math is hard for me." (P5)

Overthinking. Students were overthinking their performance in Math. Through this, students dwell on their incompetence. Some students were belittling themselves and overthinking passing the subject.

"I belittle myself and overthink that the Math subject will be the hindrance in passing my studies." (P2)

Self-Pity. Furthermore, students developed self-pity, where they had a negative outlook toward Math. Students feel sorry for themselves compared to others,

see themselves as failures, mistrust their chances of success, and believe they are hopeless in Math. Some students were upset when there was a Math discussion and claimed they were a failure. Moreover, the students felt hopeless. The lines from participants 6, 11, 24, and 19 provided the claim:

"I feel pity for myself because others are happy during Math subject while I am upset." (P6)

"I felt that I was a failure in that field." (P11)

"It could be better. I feel like I do not have a chance of passing my Math class." (P24)

"I will never be good at Math" (P24)

"I feel hopeless as one of those students who struggle in learning Math because we need Math." (P19)

Feeling Ashamed in Answering Math. Students showed their struggles by feeling ashamed in answering Math. The students were ashamed while answering a Mathematical problem on the board. Although some students participated in Math activities, they felt embarrassed because of not answering the questions. Thus, shame affects students' confidence, involvement, and overall, Math learning performance. Participants 17 and 23 emphasized this claim:

"It was the time when the teacher let me answer a Mathematical problem on the board. I have difficulty answering it. I was ashamed when I got stuck-up at the board." (P17)

"My worst experience was when our teacher gave an oral recitation in Math, and then as a person who was hungry for points, it seemed like I was the only one who did not answer the questions; I felt embarrassed." (P23)

Having Math Anxiety. With the performances of students, most of them were having Math anxiety. The students were anxious when asked to solve Math problems since the lessons were easier than the given activities. Also, some students were behind during Math discussions. When confronted with Math-related tasks, students experience sensations of fear and tension. This claim was supported by participants 1, 19, 25, and 18:

"I experienced anxiety or fear when I faced Math-related tasks. I avoid doing Math activity and feel

anxious when asked to complete Math assignments or tests because I fear not answering them correctly." (P1)

"It is hard for me, and I easily panic when I face Math problems. The lessons are way easier than the quizzes." (P19)

"I am afraid answering Math when my teacher starts giving activity, recitation, and individual answering on the board." (P25)

"I have anxiety and have limited practice in solving Math." (P18)

"When I think about learning Math, a part of me feels overwhelmed and anxious. I struggle to understand the concepts and feel like I am one step behind my classmates. It can be frustrating when I spend hours trying to solve a problem and still do not get the right answer." (P18)

The findings demonstrated that students had a typically negative attitude toward linear programming Mathematics word problems (LPMWPs). This study recognizes and enhances previous empirical data on students' attitudes about studying Mathematics word problems. The study suggests that teachers develop students' Mathematical interests as early as possible. Changing classroom teaching approaches could be a solution for improving students' understanding, achievement, and motivation when studying Math word problems. Continuous professional development courses for instructors should be implemented to improve education, assessment, and student attitudes (Wakhata et al., 2022). Evidence shows that as students' progress through school, their attitudes toward Mathematics become more unfavorable (Geisler & Rolka, 2023). Motivation and anxiety related to Mathematics play a significant role in performance and overall satisfaction. Augmented reality (A.R.) can enhance these factors by providing users with engaging visual experiences (Chen, 2019). Math performance was negatively connected with Math anxiety and positively correlated with Math enjoyment and self-efficacy (Živković & Doz, 2023). Similarly, this suggests that most of these students still suffer from Mathematical anxiety and have difficulty achieving academic success in Mathematics (Casinillo, 2023).

Promoting a growth attitude is essential for overcoming self-doubt. Teachers can provide constructive criticism

highlights individual improvement and creates a supportive classroom environment where mistakes are recognized as learning opportunities. Teachers can boost motivation by emphasizing Mathematical concepts' importance and practical applications. Connecting Math to real-world experiences and engaging students in problem-solving projects that capture their interests can help to rekindle their passion. Encouraging peer cooperation through group projects, pair programming, or Math clubs can help students form a supportive network to discuss and solve challenges. Recognize and validate students' worries by engaging in an open conversation. Teach students stress-management skills such as deep breathing exercises and mindfulness activities that they can employ during difficult arithmetic projects.

C. Students' Struggled in Math View Themselves in the Future

One theme arose about how the students who struggled in Math view themselves in the future, longing for Math enhancement. This theme reflects students' desire to improve their Mathematical abilities and get over their previous shortcomings. Students may be aware of the value of Math in numerous facets of life and career options, which inspires them to focus on developing their Math skills.

Longing for Math Enhancement

Despite the students' challenges, they longed for Math enhancement. Students grasped various strategies to develop their Mathematical knowledge and abilities, including studying, practicing, and participating in problem-solving activities. Two subthemes emerged in the pursuit for students longing for Math enhancement: (1) Eagerness to Learn Math; and (2) Positive View Towards Learning Math in the Future.

Eagerness to Learn Math. The willingness of the students to learn Math is a beneficial characteristic that can have a major impact on their engagement, motivation, and accomplishment in the subject. The students were hoping to explore, understand, and learn Math. They longed to help their future students and view themselves as successful individuals despite their struggles in Math. Thus, students focused on fulfilling their success despite their struggles in Math. This was supported by participants 1, 2, 3, 10, 19, 20, and 22:

"I will be able to learn Math and apply what I experienced in the previous years, and I hope this

college year, I will explore, understand, and learn Math as I need to give it a shot, be attentive to the teacher, positively minded, have confidence and more dedication in learning Math. In addition, be the kind of teacher someday to help my students by advising them about certain struggles." (P1)

"With hard work, determination, eagerness, I still see myself as a successful person even though I am struggling in Math today." (P2)

"Although I am struggling right now, I am certain that these struggles are my motivation and lessons because life is all about learning and being a better individual someday." (P3)

"I can see myself in the future as a person who still struggles in Math but not in the same situation as now. I can see improvement, minor or major improvements." (P10)

"I see myself as someone who overcomes the struggle in learning Math. I think that I need to work out on this struggle so that I can bravely face those Math problems and I will not panic anymore." (P19)

"As a future teacher in Math, I should do my best to guide and teach my students to learn Math and could complete various professional development as a teacher. Also, I must be open-minded to the evaluation given me to improve." (P20)

"If I struggle today, this will not affect my future. I will let my struggles motivate me to aim to become a teacher. So, I should keep learning Math and know Mathematical tricks in the future." (P22)

Positive View Towards Learning Math in the Future

Creating a favorable attitude toward Math study in the future is critical for students' long-term involvement, motivation, and performance in the subject. The students see themselves as equipped with problem-solving skills. The effect of having a good attitude toward Math promotes interest and progress. The lines from participants 5, 14, and 24 provided the claim:

"I see myself in the future as a person who will develop skills in Math." (P5)

"As a student, I believe these struggles are part of our lives. That is why it is very important to study efficiently."

I also knew that these struggles could be a way for me to motivate my future students, as well.” (P14)

“I think that if I disregard the thought that Math is difficult and I will never understand Math, I could see myself doing great in Math.” (P24)

The findings revealed that problem-based learning materials matched the effective criteria and increased Mathematical problem-solving and metacognition capacity. When problem-solving, students’ metacognition fulfilled the levels of strategic use, aware use, and tacit usage (Siagan et al., 2019).

Developing an engaging and helpful learning environment to cultivate students’ motivation to learn arithmetic is critical. Teachers can start by instilling a positive attitude toward Mathematics and recasting it as an attractive and approachable subject. Engaging and interactive teaching strategies like hands-on exercises, puzzles, and Math games can captivate students’ attention and make arithmetic fun. It is critical to cultivate students’ confidence, self-belief, and growth mindset to foster a good attitude toward Math learning in the future. Teachers can assist students in developing a positive attitude by applauding their development and concentrating on their unique skills and accomplishments.

IV. CONCLUSIONS AND RECOMMENDATIONS

The study’s results led to the formulation of the following conclusions:

1. Students often struggle with learning Math due to various factors that hinder their comprehension and performance. These factors include difficulties in Math comprehension, viewing Math as a difficult subject, poor performance in Math, lack of basic foundation in Math, ineffective teaching, negative attitudes towards Math, and a lack of interest in Math.
2. Students frequently associate Math with negative memories and experiences contributing to their struggles. The absence of interactive teaching strategies and step-by-step instructions led to a restricted comprehension of Mathematical ideas. They cited situations in which they had trouble recalling the procedures for solving Mathematical problems, which resulted in uncertainty during assessments. Negative emotions mark the lifeworld of Math-challenged students at the chosen teacher education school, lacking confidence and

difficulties comprehending and applying Mathematical concepts.

3. Students keep an optimistic outlook, ask for help when necessary, and persevere in their educational endeavors.

Based on the findings and conclusion, it is commended that:

1. Students may seek assistance from teachers, classmates, or tutors who can provide guidance and clarification on difficult concepts.
2. Math teachers may explore the effectiveness of hands-on and interactive activities, such as manipulatives, educational games, and interactive technologies, in enhancing enjoyment and comprehension of abstract concepts.
3. Engage in regular one-on-one sessions with struggling students to understand their negative perceptions and attitudes towards Math.
4. Teacher Education Institution may implement tutoring practices that can support students in overcoming their struggles in Math.
5. Further research could be undertaken into instructors’ experiences in delivering Math lessons to see if there is a relationship between students’ struggles and teachers’ difficulty in delivering Math lessons.

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