

Exploring the Impact of Social, Psychological, and Environmental Factors on Secondary Learners' Poor Numeracy Achievement

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INTRODUCTION

Numeracy skills are vital for individuals to effectively navigate and succeed in today's increasingly quantitative and data-driven world. Elementary education plays a crucial role in developing a strong foundation in numeracy skills among students. However, there is a significant concern regarding poor numeracy achievement, not only among elementary learners, but secondary learners, as well. Many students struggle with basic mathematical concepts, which can have long-lasting implications for their educational journey and future opportunities.

Program for International Student Assessment (PISA) is a benchmarking tool used by the Organization for Economic Co-operation and Development (OECD) to assess achievement and the application of key knowledge and skills of 15-year-olds in reading, math, and science every three years. The Philippines took part for the first time in 2018 and finished second to last in science and math and last in reading out of 79 participating nations and economies. In all three PISA courses, the vast majority of Filipino pupils fell short of the required competency levels, with the socioeconomic status disparity being particularly large. These findings highlight how urgently the Philippines' basic education system needs to improve its quality.

Early math and numeracy skills are crucial for later academic success. This includes math achievement as well as other subjects such as reading (Fuson, Sarama, & Clements, 2015).

The significance of early math has been demonstrated by a number of studies (Aubrey & Godfrey, 2003; Aunio et al., 2015; Clerkin & Gilligan, 2018; Jordan et al., 2009). The basis for future mathematical concepts and potential careers is laid by the learning that occurs during early infancy.

The onset of COVID-19 pandemic made it worse on the part of the learners. The shift to modular distance learning from the usual face to face interactions made it more challenging especially to our young learners. Several numeracy assessments were conducted to elementary and secondary learners to determine their numeracy level. Results revealed that majority of them failed to master the basic numeracy skills that must be mastered in the elementary leading to a growing concern about their mathematics achievement in later years.

While many factors have been identified as contributing to this struggle, there is still much to learn about the impact of social, psychological, and environmental factors on learners' numeracy achievement. This research seeks to examine the role of these three factors in secondary learners' numeracy achievement and the potential implications for their future academic success. Through a series of qualitative and quantitative studies, this research will investigate the influence of family dynamics, peer relationships, self-esteem, and external environment on numeracy achievement and how these factors interact with one another. Results from this research will provide valuable insights into the complex nature of numeracy achievement and help inform educators and policymakers about effective strategies for addressing the needs of secondary learners.

Research Objectives:

The study aims to explore the impact of social, psychological, and environmental factors on the poor numeracy

achievement of secondary learners. Specifically,

- it seeks to identify the social factors contributing to their poor numeracy achievement;
- examine the psychological factors influencing their numeracy skills;
- analyze the environmental factors affecting their performance; and
- provide evidence-based recommendations for addressing the underlying issues contributing to poor numeracy achievement.

LITERATURE REVIEW

This chapter presented the relevant literature that the researcher thought would support the significance of the current study.

Social Factors

Parental Involvement

Over the past years, parental involvement has been a topic of extensive research, and its significance is magnified when it comes to numeracy skills. The first teachers, mentors, and model for children are the parents. Parents engagement with children in meaningful mathematical activities can kindle an early interest in numbers, setting the stage for a lifelong affinity for mathematics. Positive parental involvement can have several impacts. These include boosting confidence, enhancing problem-solving skills, fostering creativity, and improving academic performance (© SkillsYouNeed, 2002). However, the responsibility for students' numeracy skills development should not be placed solely on parents. According to Cao, Le, Tran, and Phan (2023) findings from their study help teachers realize that they need to change their teaching methods in order to have more positive effect on the development of students' numeracy skills.

Peer Interactions

Peer interactions significantly enhance students' comprehension of mathematical concepts. To promote effective collaboration, teachers should strategically pair students, demonstrate productive ways to engage with one another, supply necessary tools, and give targeted and personalized guidance. Students who are struggling may particularly benefit from working with peers who can offer explanations, clarify procedures, and facilitate question-and-answer exchanges (Zorfass & Brann, 2014).

A stage for positive learning environment can also be set by peer interactions; understanding may also be improved when students engage with their peers more when discussing math strategies. (© Digital Promise, nd)

Social Environment

According to Evie & McGuire (2023), environmental factors that impact child development usually fit into the following categories like: social environment, emotional environment, and economic environment. Social environment is the relationship of the child with others at school and in the community meanwhile emotional environment is how well families meet the child's relational needs at home. On the other hand, economic environment is the family's ability to provide financially for the child. The authors emphasized the role of environment on the development of a child. An example of environmental influence on development is a case of a child from a wealthy family. Regardless of the learning abilities, access to better education and facilities will place a child in a better position than a child from a low-income family with the same challenges. The environment of a child determines how well they develop based on the exposure they get. The environment will influence how children eventually grow up whether social, economic, or even physical

According to Sultan & Bing (2020), there are various factors affecting the numeracy skills of the students. These factors include attendance issues, lack of focus, health problems, unresponsiveness in class, disinterest in learning, and family issues among remedial students. In addition, the review conducted by Csapó (2022)

showed that social factors such as ability stratification, parental attention, and teachers' expectations influence students' affective characteristics like self-concept, self-esteem, and motivation, ultimately impacting mathematics achievement.

Environmental Factors

Home Environment

Math learning environment of students encompasses the opportunities provided by their home, school, and community that contribute to their development of math knowledge and skills. The experiences students have and the beliefs and attitudes toward math held by their peers, parents, and teachers can influence the development of students' math skills and math mindset.

A child's home learning environment is critical to the development of early math skills. Exposure to cognitively stimulating home environments which allow children to engage in learning within their homes supports students' cognitive growth and may mitigate the risk of ADHD. During the upper elementary years, students' math learning environment expands to include their home, school, and community (© Digital Promise, nd).

In a review article by Silver & Libertus (2023), math skills are linked to long-term career, health, and financial outcomes. An individual's cognitive abilities can predict their math performance, but environmental factors, such as cultural differences and the level of math engagement, also play a role. The authors summarized evidence showing that factors like language differences, exposure to math-related language, socioeconomic status, attitudes and beliefs about math, and involvement in math-related activities all influence young children's math performance. These factors impact both individuals and communities. At the community level, language and societal attitudes are key. Children exposed to languages with precise number words perform better in both non-symbolic and symbolic math tasks. Additionally, children learning languages with regular structures (such as embedded fractional parts and non-inverted number words) show stronger symbolic math performance. Moreover, communities with more pronounced gender stereotypes and less gender equity tend to have larger gender gaps in symbolic math performance.

In terms of individual level, children from higher socioeconomic status households perform better in symbolic math tasks. When it comes to math engagement, children with exposure to frequent math activities and math talk have stronger performance in symbolic math tasks. Lastly, in terms of attitudes and beliefs of parents and teachers, children with exposure to caregivers with more positive attitudes, lower math anxiety, and stronger beliefs about math importance have stronger performance in symbolic math tasks.

School Environment

The classroom environment plays a crucial role in student learning. For example, the atmosphere in which a student learns can either enhance or hinder their ability to retain new information. In a noisy or distracting environment, a student may struggle to concentrate on the lesson. Such situations can negatively affect academic performance, as students may not put in the necessary effort during the learning process. The learning environment also influences each student's preferred learning style, among other factors. What may seem like a minor change to one student could have a significant impact on another, highlighting the importance for teachers to understand their students well and address their individual needs to ensure active engagement throughout the learning process (Abeysekera, 2024).

Technology Resources

Technology can provide vital opportunities for teaching mathematics and STEM classrooms. We can enhance the learning process and make concepts come through engaging and interactive media. There should be additional supports to address the particular needs of all learners and create customize learning experiences.

Additionally, technology offers students more opportunities to engage with and explore mathematical concepts. Through games, simulations, and digital tools, learners can discover and interact with math in new

ways. Increased access to technology in math education allows for a more personalized learning experience. Since every student is unique, technology can provide tailored content and resources to meet individual needs. Learners can access discussions, tutorial videos, screencasts, and other instructional materials on their own devices and at their own pace. This way, if one student is still struggling with a topic while another is ready for more advanced challenges, technology allows each student to progress at their own level (Scharaldi, 2020).

Psychological Factors

Self-confidence and Attitudes

Simanihuruk (2021) discussed the psychological factors that influence learning mathematics. These factors play a crucial role in how students respond to the subject. Key psychological factors include intelligence, interests, learning habits, motivation, math anxiety, concentration, self-confidence, and academic stress. To understand mathematical concepts and principles, students need to think rationally, realistically, and objectively, all of which are linked to self-confidence. The quality of teaching is also essential, as effective instruction can enhance students' engagement. In the classroom, students often lose interest in the teacher's explanations and may leave, especially when the subject is theoretical and perceived as boring. Additionally, students may feel disappointed with their academic performance. Motivation is one of the key factors that drives students to engage in learning.

An article by Tong (2022) focused on how students' psychological factors and teachers' pedagogical practices can impact literacy and mathematics learning. These factors are mindset of the learners, self-efficacy, motivation, engagement, anxiety, attitude, cognitive-linguistic skills, and the use of manipulative and peer tutoring strategies of the teachers.

Math anxiety and Stress

Mathematics anxiety has been extensively studied due to its detrimental effects on students' learning. Research indicates that this form of anxiety can disrupt working memory, resulting in increased errors and diminished capacity to effectively engage in mathematics. Students who frequently encounter mathematics anxiety are more inclined to steer clear of math-related subjects, courses, and careers. Consequently, mathematics anxiety poses challenges for short-term learning by impairing performance and long-term learning by discouraging students from pursuing opportunities and career paths in mathematics (Buckly, Reid, Good, Lipp & Thomson, 2016).

Additionally, mathematics anxiety can hinder the teaching of mathematics. Teachers with high levels of mathematics anxiety often exhibit lower confidence and are more likely to avoid teaching the subject when given a choice (Gresham, 2018). According to Dewker et al. (2016), while comprehensive population-level studies are lacking, researchers estimate that between 6% and 17% of individuals experience mathematics anxiety (© State of Victoria Department of Education and Training, 2020).

Perceived importance and relevance

Kibrislioglu (2015) describes "mathematical perception" as an individual's view of mathematics, which may be positive or negative, and seen as either useful or not, based on their personal preference for the subject. This perception influences a person's tendency to either engage in or avoid mathematical activities (Edo et al., 2023).

Hodgen and Askew (2007) as cited by Fitzmaurice et al. (2021) demonstrated that mathematics is viewed less favorably than other subjects. Many students both low and high attaining, perceived mathematics to be dull, boring, and irrelevant (Matthews and Pepper, 2006; Mujtaba et al., 2014; Smith, 2004). Others have seen it as too traditional and less useful than other subjects (Tebbut, 1993).

Learning strategies and habits

According to Singh (2016), study habits are an individual ability. Some children like to read alone while others

prefer to be in groups, some read aloud and others silently; there is no strict yardstick to measure the type of study habits. Many students are unsuccessful in their examination not because they are short of knowledge or ability, but because they do not have adequate study habits and study skills.

Learning strategies refers to a set of approaches that students use to acquire information and knowledge. Such approaches may include taking notes, organizing information, summarizing and coding (Muelas & Navarro, 2015). Effective learning strategies is a techniques and approaches learners use to acquire, store, retain, recall and adoption of knowledge (Almoslamani, 2020).

Related Studies

Social Factors

Parental Involvement

Jiang et al., (2023) investigated the relationship between parental homework involvement and student's achievement in a specific subject by using meta-analysis. This meta-analysis investigated the relationship between parent homework involvement and students' mathematical achievement from two dimensions: supportive (SPI) and intrusive parent homework involvement (IPI), along with their moderators. There were 20 empirical studies between 2005 to 2022, 41 independent effect sizes were included (N = 16, 338). The estimations for the effect size were obtained by transforming Fisher's correlation coefficient. The study performed the heterogeneity tests of the magnitudes grouped according to different moderators, and investigated the publication bias that affects meta-analysis studies. Results revealed an overall positive link between SPI and students' mathematics achievement and a negative link between IPI and students' mathematics achievement.

Peer Interactions

A key strategy to being successful in math is seeking. A lot of research focused on how students seek help from teachers. Lobczowski et al., (2021) analyzed conversations from eight focus groups related to students' path to math success. The researchers found that peer interaction is critical to their math success. The themes that emerged were support vs. comparison, balance of effort in the study groups, and friends vs. peers. The findings qualitatively extend current research by highlighting key ideas that impact peer interactions, such as increased reluctance to seek help in larger classes.

Almas et al., (2020) investigated the effect of peer instruction method on the first course mathematics education students' academic achievement and the attitudes of students using peer instruction to mathematics analysis lesson in Suleyman Demirel University, Kazakhstan. The study was carried out 15 weeks with 60 participants. There were two course group randomly assigned to treatment and control groups. Results showed that peer instruction has a significant positive effect on students' achievement in the introduction to mathematics analysis course. In addition, there is a positive impact of peer instruction on peers' understanding and peer instruction makes a good atmosphere in the class.

Social Environment

Apriliyanto et al., (2017) examined the relationship between social interaction and mathematics learning achievement among Grade 10, 11 and 12 students of SMA Negeri 1 Wuryantoro. The researchers used correlational descriptive method involving 36 students. A survey questionnaire for social interaction and documentation for learning outcome was used to gather the data. The result of the study showed that there is a low level of social interaction and mathematics learning achievement. The researchers concluded that students' social interaction influences student learning achievement in mathematics subject.

Özkan & Güvendir (2014) identified the socioeconomic factors that are related to students' mathematics achievement in the national large scale test ÖBBS 2009 and the international large scale test PISA 2009. Socioeconomic factors were considered two levels. These are student level and school level. The researchers use two level Hierarchical Linear Model. The participants of the study consisted 65275 students who took

ÖBBS 2009 and 4575 who took PISA 2009 in Turkey. Results showed that in both tests, the factors that were found to be related to mathematics achievement are students' father's education and resources owned. At the school level, the educational development level of the city where the school located was found to be related to students' mathematics achievement.

Environmental Factors

Home Environment

Many studies suggest that the frequency of numeracy experiences that parents provide at home may relate to the children's mathematical development. Girard et al. (2021) tested an extensive range of math skills in 66 8-year-old, including the processing of non-symbolic quantity, understanding of symbolic number, transcoding, counting and mental arithmetic. Parents were also asked by the researcher to complete a questionnaire about their socioeconomic status, academic expectations and attitudes, and the numeracy practices that they provide at home. The researchers also measured the arithmetic fluency of the parents as a proxy for parental math skills. The findings of the revealed a positive relationship between frequency of formal numeracy practices that were at or above grade level and two separate measures of mental arithmetic. Furthermore, the findings showed that the frequency of these advanced formal numeracy practices was related to academic expectations of the parents. The results of the study suggest that home numeracy experiences predict arithmetic skills in elementary school children.

Kumar & Behera (2022) did a systematic review aimed to comprehensively identify the home environment factors that affect the literacy and numeracy learning of the students. Published studies from 2013 to 2022 were searched in the ERIC database. The researchers included 38 primary studies from 383 potentially relevant articles. Systematic reviews were excluded. The results showed that home learning environment factors affect numeracy and literacy learning. Family learning background, reading and numerical activities and home resources were the prominent factors. Other factors such as the reading the numeracy interests of children and the relationship of parents and child, also play an important role in acquiring foundational numeracy and literacy skills.

School Environment

The study of Naakaa et al., (2019) examined the influence of school environmental variables on students' performance in Junior secondary mathematics. The researchers used an expo-facto design approach and 120 secondary students were the participants in the study. A 20-item questionnaire on the influence of environmental variables on student performance was used to gather the data. Descriptive statistics such as mean and standard deviation were used to answer the four research questions. Results showed that the nearness of school to noisy facilities has a negative influence on the performance of mathematics students. In addition, classroom size, library facilities, and power supply influences the performance of mathematics students. It was further recommended that school environmental variables should be taken into consideration in the siting and running of schools in order to enhance the students' performance.

The study of Bernabini et al. (2020) revealed that early numeracy skills in preschool years have been found to be related to a variety of different factors, including Approximate number system (ANS) skills, cognitive and linguistic skills of the children, and environmental variables such as home numeracy activities. The study analyzed the differential role of environmental variables, intergenerational patterns, children's cognitive and linguistic skills, and their ANS in supporting early math skills. Sixty-four children in their last year of kindergarten and one parent of each child participated in the study. The respondents were administered a battery of cognitive and linguistic tasks, and a non-symbolic comparison task as a measure of ANS. The parents were also administered with similar tasks to evaluate their cognitive skills, math skills, and ANS skills (estimation and non-symbolic comparison), with a questionnaire on home numeracy. Results revealed that home numeracy predicted children's early math skills better than a number of parent and child variables. Considering the children's skills, their ability in the non-symbolic magnitude comparison task was the strongest predictor of early math skills.

Technology resources

Soto and González (2021) estimated the effects of technological resources on the learning of mathematics in 7th grade elementary school students, specifically on the topic of polygons in the Cartesian plane. The researchers used a descriptive-correlational approach with a quasi-experimental design of two groups and applications of pre-test and post-test. The results of the study highlighted the increase in the score between pre- and post-test for the control group was 4.99% while for experimental was 10.36%. The findings suggest that technologies help to improve the mathematics learning processes and have a satisfactory effect if used properly.

Albert et al., (2021) presented the incidence of the use of technological devices by students of the mathematics subject in secondary education in Madrid (Spain). The researchers used a sample of 31 students with low level of competence in the subject. A quasi-experimental method of pretest/posttest was used through an experimental and control group. The results of the study revealed that the use of instructional video was more than positive in the different variables under study.

Psychological Factors

Self-confidence and Attitudes

The study of Mohamad Sukarya (2023) examined the ability of numeracy value as well as factors that influence the numeracy value of students. The author used a quantitative method where questionnaires and tests were given to 54 respondents. The results of the study revealed that 61% of the respondents' numeracy value fall into the low category. The factors such intelligence, learning motivation, fatigue, family environment, facilities and infrastructure, and teacher competence are the great contributors in the numeracy of the students.

Math Anxiety and Stress

Wijaya et al. (2022) analyzed the key factors that affect mathematics achievement through teacher-parent support, stress, and students' well-being in learning mathematics. The participants of the study were 531 secondary students from five schools in Indonesia. Results revealed that the most significant factor affecting students' mathematics achievement are their interest in learning. Moreover, teachers have more considerable effect than the support of the parents which does not significantly reduce the stress levels of the students. The support of teachers and parents reduces the stress levels of the students while increasing their feelings and interest in learning mathematics subject.

Svraka & Ádám (2022) established a cognitive ability profile that focuses on the cognitive factors underlying mathematical abilities and the affective factors that influence them. Their research included 10-15-year-old students in 8 Hungarian primary schools and explored the extent to which symptoms of anxiety affect mathematical performance. The instruments used were Pedagogical Examination of Dyscalculia and the Math Anxiety Test. The results were investigated in the mathematical performance context. The study concluded that mathematical anxiety is an emotional reaction that inhibits the performance of mathematical operations and thus may reduce cognitive performance.

Perceived Importance and Relevance

Cornillez Jr. et al., (2021) evaluated the extent of the acquired skills by both mathematics and non-mathematics major students to the new gen. ed. course, Mathematics in the Modern World. The study specifically investigated the significant difference between the level of mathematical skills and perceived important mathematical skills of the students for career success. Also, the relationship between perceptions on acquired mathematical skills and important mathematical skills in Mathematics in the Modern World (MMW). The researchers used a descriptive, comparative, and correlational design of analysis. Data were gathered with the use of survey questionnaire to the 134 random teacher education students. The results of the study showed that in general, the level of mathematical skills of the math major respondents were very good, and Good for

the non-math major. When it comes to importance, math major students perceived the skills acquired as very important for career success and moderately important for non-math major respondents. In addition, results also showed a statistical significance of the difference between the level of mathematical skills ($t = 7.69$, $p = .001$) and perceived importance of skills ($t = 4.65$, $p = .001$) between the groups of students. There is a significant relationship between the students' perceived important mathematical skills and perceived level of mathematical skills ($r = .421$, $p = .001$).

Hagan et al., (2020) investigated the perceptions of students towards mathematics and how it affects their academic performance. The researchers used a descriptive survey design. The respondents of the study consisted of 297 SHS students of which 180 were males and 117 were females. Results of the study showed that students have positive perception towards mathematics though they see it to be difficult in a sense that it is important as it used in their daily lives. Another findings revealed a weak and negative relationship between perception and mathematics performance.

Learning Strategies and Habits

According to Alghadari et al., (2022), mathematical literacy prepares future generations to deal with the challenges of a changing world. However, the knowledge and abilities of the students are still below the optimal level. The researchers investigated how students' learning habits, which were based on chronology of time and cognitive processes, affect their literacy in mathematics. The study employed an observational approach with vocational students in West Java. The study examined the measurement and structural model up to the second-order level. The results showed that the habit of reviewing had a substantial impact on factors in formulating mathematical models.

Eva (2018) investigated the extent of the influence of Learning habits and numerical ability in Mathematics. The researcher employed a survey to a sample of 40 students, with a sampling technique used was simple random sampling. The findings revealed that there is a significant influence between learning habits and numerical abilities together on mathematical learning achievement. Also, there is a significant relationship between learning habits and mathematics learning achievement. Lastly, there is a significant influence between numerical abilities and mathematics learning achievement.

Oginni (2021) investigated the influence of psychological factors (school environment, teachers' attribute, parental factors and students' disposition) on students' academic performance in Mathematics. The used a descriptive research survey type and *expo facto* design. The sample consisted of 150 respondents and were selected using stratified random sampling technique. Results showed that school environment has no significant influence on students' performance in Mathematics. The study also revealed that parental factors and students' disposition have significant influence on students' performance in Mathematics.

Sultan & Bing (2020) conducted a study to understand the factors that affect the implementation of LINUS (Literacy and Numeracy) program for hardcore students in three schools in Kinta Utara District, Ipoh, Perak. They used a purposive sampling method in selecting teachers as participants. Interviews, observations and review of documents were used to gather information. The data was analyzed using content analysis and constant comparative method. The results of the study showed that the hardcore students have attendance problem, lack of focus during the learning process, health and learning problems not giving response when questions are asked by the teacher, have no interest in learning and also have family problems. All of these problems have implications in the performance of LINUS in the school, state and the ministry especially if they are not controlled earlier. There is a need for various parties to play their part in ensuring the performance of LINUS results is at a commendable level.

Research Questions

1. What is the demographic information of learners in terms of their age, gender, socioeconomic status of parents, parental education, geographic location, family structure, and access to technology?
2. What are the factors that contribute to learners' poor numeracy achievement?
 - 2.1 Social

2.2 Psychological

2.3 Environmental

3. Is there a significant relationship between the demographic profile and the factors that contribute to learners' poor numeracy achievement?
4. Is there a significant relationship among the factors that affect the numeracy achievement of the learners?
5. What intervention strategies may be proposed based on the findings of the study?

Scope and Limitations

The research focused on public secondary schools and targeted Grade 7 learners identified as non-numerates in five secondary schools within the division that had a high percentage of non-numerates based on a pre-test. The study was conducted during the school year 2023-2024. It primarily investigated the factors contributing to low numeracy performance among Grade 7 learners, including social, environmental, and psychological factors. Data were collected through surveys administered in the selected schools, aiming to provide insights and recommendations to improve numeracy performance.

The research exclusively focused on public secondary schools, excluding private schools, which were presumed to have different dynamics and performance factors. The findings were not applicable to other grade levels, as the study concentrated solely on Grade 7 learners. The results were also limited to the specific area where the research was conducted, making them less representative of the entire country or other regions. The accuracy and reliability of the data depended on the honesty and cooperation of the participating students, potentially influencing the validity of the findings. The research was conducted within the specific time frame of the 2023-2024 school year, which may not have captured long-term trends or changes in factors affecting numeracy performance. Additionally, due to time and resource constraints, the study could not explore all potential factors contributing to low numeracy performance comprehensively.

RESEARCH METHODOLOGY

Research Design

The study adopted a **descriptive survey research design** to systematically investigate and document the factors contributing to poor numeracy achievement among learners in specific public schools. This design is appropriate because it allows the researcher to collect detailed data, analyze patterns, and make inferences about the identified issues without experimental manipulation.

Sampling

The study utilized a purposive sampling also known as judgmental, selective, or subjective sampling, a type of non-probability sampling in which researcher has chosen people from the public schools to participate in the surveys based on their own judgment (Alchemer,2021). Purposive sampling was used to identify schools with high percentage of non-numerates based on the numeracy assessment conducted using the researcher-made test.

The following schools were purposively selected: 1) Jacinto P. Elpa National High School, 2) Buenavista National High School, 3) Carmen Integrated School, 4) Vicente L. Pimentel Sr. NHS, and 5) Meliton M. Ajos Memorial Integrated School.

Learners who belong to the non-numerates were the respondents of the study. Table 2 shows the distribution of respondents for this study. With a population of 280, the sample population to be considered in this research is 164. Jacinto P. Elpa NHS School, being the largest high school in the division, has the greatest number of respondents, while Meliton M. Ajos MIS School, has the least number of respondents, which is 14. Purposive sampling was used to determine the number of respondents per high school.

Table. Distribution of Respondents

Schools	Population (non-numerates)	Sample Population
Jacinto P. Elpa NHS	102	60
Buenavista NHS	90	53
Vicente L. PSNHS	48	28
Carmen Integrated School	26	15
Meliton M. Ajos MIS	14	8
TOTAL	280	164

Data Collection

The researcher administered survey questionnaires to the learner-respondents. A questionnaire, according to Question Pro (n.d.), was a type of research instrument that consisted of a series of questions designed to elicit information from a respondent. The study used a researcher-made survey questionnaire. It was composed of four parts. Part I pertained to the demographic information of the learners. Part II pertained to the social factors that contributed to learners’ poor numeracy achievement, Part III pertained to the environmental factors that contributed to learners’ poor numeracy achievement, and Part IV pertained to the psychological factors that contributed to learners’ poor numeracy achievement.

The researcher conducted the study according to its timeline of activities, supported by the Special Education Fund. The researcher personally administered the questionnaires to the respondents by giving prior notice to the respective school heads regarding the research implementation. The researcher also assisted the respondents in case of confusion in giving responses. After the respondents completed the survey questionnaire, it was then retrieved by the researcher, and the respondents had to sign the attendance sheet.

Ethical Issues

Two important ethical issues were considered in the conduct of this study, particularly in the administration of the survey questionnaires to the respondents. One was confidentiality. Confidentiality referred to the respondents’ right to have their own volition respected regarding the divulgence of their identity. Moreover, any legal requirements under the data privacy act were adhered to (Kelley, Clark, Brown, & Sitzia, 2003). Another ethical issue considered in this research was informed consent. It was the process in which the researcher educated the respondents about the risks, benefits, and alternatives of the study. The researcher made sure that the respondents were competent to make a voluntary decision about whether they would participate in the study and that they could withdraw from participation at any time.

Data analysis

The following statistical tools were used to analyze the data that were gathered through this research.

Frequency Counts and Percentage. This was used in consolidating the demographic profile of the respondents. This is the simplest method of working with quantitative data. Items were classified using a specific scheme, and an arithmetic count of the number of items within the text that belong to each classification. (Frequency Counts, n.d.) Furthermore, percentage was calculated by dividing the frequency of participation in the category by the total number of participants and multiplying by 100 percent (Korb, 2013).

Likert Scale. A Likert scale was used in the survey research questionnaire on factors that contribute to learners’ poor numeracy achievement. Question Pro (n.d.) defines a Likert scale as a unidimensional scale used by researchers to gather respondents' attitudes and opinions.

Inferential Statistics. T-test was used to identify relationships between the demographic profile and the factors that contribute to learners, poor numeracy achievement. Spearman Rank Correlation was used to determine the relationship among the factors that affect the numeracy achievement of the learners.

DISCUSSION OF RESULTS

Demographic Profile of the Learners

The following table presents the frequency and percentage distribution of the demographic profile of the learners.

Table 1 Descriptive Statistics of the demographic profile of the learners.

		Frequency	Percent
Age (years)			
	11	1	0.6
	12	46	28.4
	13	87	53.7
	14	15	9.3
	15	7	4.3
	16	6	3.7
Gender			
	Male	76	46.9
	Female	86	53.1
Parents Monthly Income			
	P5000 & below	66	40.7
	P5000 to P10000	68	42.0
	P10000 to P20000	13	8.0
	P20000 to P30000	8	4.9
	P30000 to P50000	5	3.1
	P50000 and above	1	0.6
Parental Education			
	Elementary	14	8.6
	High School	141	87.0
	College	7	4.3
Geographic Location			
	Urban	53	32.7
	Sub-urban	1	0.6
	Rural	108	66.7
Family Structure			
	Conjugal	104	64.2
	Extended	24	14.8
	Single Parent	24	14.8
	other	10	6.2
Access to Technology			
	High	19	11.7
	Moderate	70	43.2
	Low	64	39.5
	None	8	4.9

N = 162

Table 1 showed the distribution of the learners' demographic profile. Based on the table, more than half of the distribution consists of 13-year-old learners (54%) and majority of them are Female (53%). In addition, majority of monthly income of the parents ranges from below P5, 000 (41%) to P10, 000 (42%) and many of them were High School graduates (87%). In terms of the geographic location, the number of learners from Rural (67%) is nearly twice the number of learners from Urban (33%). When it comes to family structure, most of them are from conjugal family (62%) and learners from extended family (15%) have equal number of

learners from single parent (15%). Lastly, many learners have moderate access to technology (43%).

Social Factors that affect the numeracy skills of the learners

To determine the general response of the learners, descriptive statistical measures such as mean and standard deviation were used.

Table 2 Parental Involvement, Peer Interactions, and Social Environment of the learners

Social Factors		Mean	Std. Deviation	Remarks
Parental Involvement				
	My Family’s encouragement and support greatly contribute to my motivation to excel in numeracy skills.	3.46	0.83	Very much true
	My family’s attitude towards numeracy skills has a noticeable impact on my own attitude and efforts.	2.90	0.82	Mostly true
	My family actively engages in activities that help improve my numeracy skills outside of school.	2.48	1.12	Slightly true
Peer Interactions				
	Peer interactions play a significant role in motivating me to improve my numeracy skills.	2.86	1.04	Mostly true
	I find that my friends’ attitudes towards numeracy skills impact my own interest in mastering them.	2.82	1.01	Mostly true
	Collaborative learning with peers helps me understand numeracy concepts better.	3.56	0.75	Very much true
Social Environment				
	Teachers who show genuine interest in helping me improve my numeracy skills inspire me to learn.	3.86	0.47	Very much true
	Teachers’ teaching methods greatly affect my understanding and performance in numeracy.	3.79	0.55	Very much true
	I feel comfortable seeking help from my teachers when I struggle with numeracy concepts.	3.39	0.90	Very much true
Note. N = 162				

Table 2 showed the social factors that affect the numeracy skills of the learners. Data revealed that there is a pattern of “Very much true” response on item related to encouragement from the family (M = 3.46, SD = 0.83), collaborative learning with peers (M = 3.56, SD = 0.75), genuine interest shown by teachers (M = 3.86, SD = 0.47), teaching methods (M = 3.79, SD = 0.55) and being comfortable seeking help from teachers (M = 3.39, SD = 0.90). In addition, there is a relatively “Mostly true” response pattern for family’s attitude towards numeracy skills (M = 2.90, 0.82), peer interactions (M = 2.86, 1.04), and friends’ attitudes (M = 2.82, SD = 1.01). Only engagement of family activities that the learners answered “Slightly true” (M = 2.48, SD = 1.12).

Positive parental involvement can boost the confidence of their children, enhance problem-solving skills, and improve academic performance. Evie & McGuire (2023) emphasizes the importance of a positive emotional environment at home. Encouragement from family members fosters a sense of security and can motivate learners to engage with numeracy tasks. ŞENGÖNÜL (2022) found that parental involvement at home and at school, such as parents’ reading to their children at home providing encouragement and support for learning, maintaining high aspirations and expectations on education and academic success of their children, established communication, discussing school issues with their children, all have positive impact on the academic achievement of children.

According to Zorfass & Brann (2014), peer interactions can greatly benefit a student’s understanding of mathematical concepts. The article reviews of Laal and Ghodsi (2011) revealed the benefits of collaborative learning for promoting student critical thinking skills. Also, working with peers allows learners to explain concepts to each other and helps develop a social support system for learners.

The study of Frommelt et al. (2020) highlighted the impact of teacher enthusiasm and effective teaching methods on student motivation and engagement in mathematics. When teachers show genuine interest and utilize engaging methods, students are more likely to see math as a valuable subject. Effective teaching methods that cater to different teaching styles and utilize engaging activities can significantly improve students' numeracy skills. Accordingly, several studies observed that enthusiastic teaching behavior is positively associated with student's intrinsic motivation (Patrick et al., 2000), interest (Keller et al., 2014), active learning and engagement (Patrick et al., 2000) and level of enjoyment (Frenzel et al., 2009).

When it comes to comfort in seeking help from teachers, Paris (2005) discussed the importance of creating a safe learning environment where students feel comfortable seeking help from teachers. This fosters growth mindset and allows learners to overcome challenges in numeracy. When students feel safe and supported in asking questions and seeking help from teachers, they are more likely to persevere through challenges and develop stronger numeracy skills.

The results described in table 2 were supported by Apriliyanto et al., (2017) and Kumar & Behera (2022) highlighting those social interactions of students and parent-child relationship influences student learning achievement in mathematics subject.

Environmental Factors that affect the numeracy skills of the learners

Table 3 Home Environment, School Environment, and Technology Resources of the learners

Environmental Factors		Mean	Std. Deviation	Remarks
Home Environment				
	The availability of a quiet and suitable study space at home greatly impacts my ability to master numeracy skills.	3.14	0.95	Mostly true
	Having access to educational resources (books, internet, materials) at home contributes significantly to my numeracy skill development.	3.27	0.97	Very much true
	The level of support and encouragement I receive from my family at home influences my motivation to improve numeracy skills.	3.29	0.86	Very much true
School Environment				
	The availability of well-equipped learning facilities (labs, study areas) at school affects my ability to practice and improve numeracy skills	3.29	0.89	Very much true
	Teachers who actively promote the use of math-related resources contribute significantly to my numeracy skill development	3.52	0.73	Very much true
	The support I receive from teachers at school impacts my motivation to excel in numeracy skills	3.48	0.79	Very much true
Technology Resources				
	Access to digital devices (computers, tablets, smartphones) for practicing numeracy skills plays a significant role in my learning	2.99	1.02	Mostly true
	The availability of online resources (websites, apps) helps me improve my numeracy skills to a great extent	3.02	1.02	Mostly true
	Teachers who integrate technology into their numeracy lessons positively impact my understanding and engagement with the subject	3.59	0.65	Very much true
Note. N = 162				

Table 3 showed the environmental factors that affect the numeracy skills of the learners. Based on the table, there is a pattern of “Very much true” response on items about having access to educational resources at home ($M = 3.27, SD = 0.97$), level of support and encouragement from family ($M = 3.29, SD = 0.86$), availability of well-equipped learning facilities ($M = 3.29, SD = 0.89$), Teachers who actively promote the use of math-related resources ($M = 3.52, SD = 0.73$), support received from teachers ($M = 3.48, SD = 0.79$), and teachers who integrate technology into their numeracy lessons ($M = 3.59, SD = 0.65$). Furthermore, the table also shows a pattern of “Mostly true” response on items related to availability of quite and suitable study space at home ($M = 3.14, SD = 0.95$), access to digital devices for practicing numeracy skills ($M = 2.99, SD = 1.02$), and availability of online resources ($M = 3.02, SD = 1.02$).

The findings of this study align with research by Melhuish et al. (2008), Missall et al. (2015), and Girard et al., (2021) who found that early numeracy development benefits from a stimulating home environment with rich learning activities and a positive parental attitude towards math. When it comes to school environment, learners have the perceptions that strong supports from their teachers influenced their numeracy skills. According to Amoo (2000), teacher effectiveness and student achievement in mathematics are positively correlated.

Naakaa et al., (2019) stated that school environment variables such as classroom size, library facilities and power supply should be taken into consideration in the siting and running of schools in order to enhance the students’ academic performance.

According to Scharaldi (2020), increase access to technology for math allows for more customized learning experience. Also, technology resources help improve the mathematics learning process (Sotto & González, 2021). The results in table 3 aligned with Albert et al., (2021) that revealed that the use of technology in instruction yield more positive results.

Psychological Factors that affect the numeracy skills of the learners

Table 4 Self-confidence and attitudes, Math Anxiety and Stress, Perceived importance and relevance

Psychological Factors	Mean	Std. Deviation	Remarks
Self-confidence and attitudes			
Having a strong sense of self-confidence significantly enhances my ability to master numeracy skills.	3.15	0.83	Mostly true
A positive attitude toward numeracy skills greatly influences my motivation to improve them.	3.31	0.87	Very much true
Believing in my own potential to excel in numeracy skills positively impacts my performance.	3.28	0.81	Very much true
Math Anxiety and Stress			
Experiencing anxiety or stress when dealing with math-related tasks negatively affects my ability to master numeracy skills.	2.72	0.93	Mostly true
Feeling anxious when performing numeracy activities in front of others hinders my performance.	2.81	0.99	Mostly true
Math anxiety often interferes with my understanding and learning of numeracy concepts.	2.90	1.03	Mostly true
Perceived Importance and relevance			
Recognizing the importance of numeracy skills for my future goals significantly motivates me to improve them.	3.59	0.71	Very much true
Believing that numeracy skills are relevant to my daily life outside of school impacts my attitude toward mastering them.	3.58	0.70	Very much true

	Seeing the practical applications of numeracy skills in real-life scenarios influences my commitment to mastering them.	3.67	0.60	Very much true
Learning Strategies and Habits				
	Using effective learning strategies (problem-solving, practicing) significantly contributes to my numeracy skill development	3.61	0.70	Very much true
	Organizing and managing my study time effectively has a positive impact on my understanding of numeracy concepts	3.28	0.88	Very much true
	Actively seeking help from teachers, peers, or resources when I struggle enhances my learning experience	3.49	0.71	Very much true
Note. N = 162				

Table 4 presents the psychological factors that affect the numeracy skills of the learners. As shown in the table, learners highly agree for they responded “Very much true” in the items regarding having believing in their own potential to excel in numeracy skill (M = 3.28, SD = 0.81), recognizing the importance of numeracy skills for future goals (M = 3.59, SD = 0.71), believing that numeracy skills are relevant to daily lives (M = 3.58, SD = 0.70), Seeing the practical applications of numeracy skills in real-life scenarios (M = 3.67, SD = 0.60), using effective learning strategies (M = 3.61, SD = 0.70), organizing and managing study time effectively (M = 3.28, SD = 0.88) and Actively seeking help from teachers, peers, or resources (M = 3.49, SD = 0.71).

The learners responded “Mostly true” for the items such as having strong sense of self-confidence (M = 3.15, SD = 0.83), Experiencing anxiety or stress when dealing with math-related tasks (M = 2.72, SD = 0.93), Feeling anxious when performing numeracy activities in front of others (M = 2.81, SD = 0.99), Math anxiety often interferes with their understanding and learning (M = 2.90, SD = 1.03).

Learners have strong beliefs that they have the potential to excel in numeracy and they recognize its importance for future goals and daily life. This aligns with studies on self-efficacy and goal orientation in mathematics achievement. Students’ self-efficacy beliefs often predict their ability to succeed in particular situation (Bandura, 1986). Specifically, in mathematics, research has shown that self-efficacy is a clear predictor of students’ academic performance (Mousoulides & Philippou, 2005; Pintrich & De Groot, 1990). When it comes to learning strategies, learners highly value seeing the applications of numeracy and using effective learning strategies. This suggests that the learners understand the importance of connecting math to real-world problems and using effective study methods.

Learners acknowledge having some anxiety or stress with math and feeling anxious during numeracy activities. Math anxiety can be a significant barrier to learning. Daher et al. (2017) demonstrated that math anxiety seems to be particularly related to self-rating, where students who think that they are bad at math are more likely to be anxious.

Simanihuruk (2021) explained that psychological factors such as intelligence, interest, learning habits, motivation, mathematical anxiety, concentration, self-confidence and academic stress influenced the student’s responsiveness. Also, according to Tong (2022), student’s psychological factor and teachers’ pedagogical practices can impact literacy and mathematics learning.

Relationship between social factors that affect the numeracy skills of the learners and their demographic profile

Table 5 Significant relationship between Social Factors and Demographic Profile of the Learners

Social Factors		Pearson Chi-square, χ^2	df	p
	Age	9.97	10	.443
	Gender	0.814	2	.667

	Parents Monthly Income	8.45	10	.547
	Parental Education	6.44	4	.169
	Geographic Location	27.41	4	<.001**
	Family Structure	14.38	6	.026*
	Access to Technology	7.58	6	.270
Note. * = significant at .05 level; ** = significant at .01 level				

Table 5 showed the results of data analysis using Chi-square test for association between social factors and the demographic profile of the learners. Data revealed that there is a significant relationship between the social factors that affect the numeracy of the learners and their geographic location ($\chi^2(4) = 27.41, p < .001$). Geographic locations and social factors such as parental involvement, peer interactions, and social environment have a complex interrelated influence on the numeracy of the learners. A supportive home environment with positive parental attitudes towards math and opportunities for numeracy practice can significantly impact achievement (Melhuish et al., 2008; Missall et al., 2015). Similarly, peer interactions and collaborative learning can enhance motivation and engagement. Students from lower socio-economic status backgrounds may have limited economic access to educational resources at home and quality schooling which could have potential impact on the numeracy development of the students.

Schools in wealthier or urban areas might have more resources, qualified teachers, and smaller class sizes which could lead to better numeracy outcomes of the learners. Regional variations in curriculum standards and teaching approaches may have an impact on the learners' numeracy development.

These results aligned with Panizzon (2014) stating that there is a significant difference in the achievement of students in rural schools when compared to their peers in metropolitan schools for a number of countries.

Relationship between environmental factors that affect the numeracy skills of the learners and their demographic profile

Table 6 Significant relationship between Environmental Factors and Demographic Profile of the learners

Environmental Factors		Pearson Chi-square, χ^2	df	p
	Age	12.97	10	.225
	Gender	2.38	2	.304
	Parents Monthly Income	7.3	10	.697
	Parental Education	2.21	4	.697
	Geographic Location	34.89	4	<.001**
	Family Structure	6.94	6	0.326
	Access to Technology	24.16	6	<.001**
Note. ** = significant at .01 level				

Table 6 showed the results of data analysis using Chi-square test for association between environmental factors and the demographic profile of the learners. Based on the table, that there is a significant relationship between the social factors that affect the numeracy of the learners and their geographic location ($\chi^2(4) = 27.41, p < .001$) and access to technology ($\chi^2(6) = 24.16, p < .001$).

This may be due to schools in urban or wealthier areas often have more resources. These resources include qualified teachers, smaller class sizes, and access to technology which can have positive influence in numeracy development. In contrast to schools from rural areas or under-resourced areas that may have limited resources that could hinder learning opportunities. Effective integration of technology can enhance numeracy learning by providing interactive tools and personalized learning experiences. Online resources like educational apps, websites and digital textbooks can supplement classroom learning and offer additional practice opportunities. In their study on the *Effect of Using Technology in Teaching and Learning Mathematics on Students' Mathematics Performance: The Mediation Effect of Students' Mathematics Interest*, Bright, Welcome, and Arthur (2024) concluded that the use of technology in teaching and learning mathematics has a significant

positive impact on students' mathematics performance. Limited access to technology and internet can restrict exposure to these resources. Students without access might fall behind their peers who can utilize technology for learning.

Relationship between psychological factors that affect the numeracy skills of the learners and their demographic profile

Table 6 Significant relationship between Psychological Factors and Demographic Profile of the learners

Psychological Factors		Pearson Chi-square, χ^2	df	<i>p</i>
	Age	9.02	10	.53
	Gender	0.36	2	.834
	Parents Monthly Income	7.10	10	.716
	Parental Education	5.15	4	.272
	Geographic Location	37.24	4	<.001**
	Family Structure	9.15	6	.165
	Access to Technology	7.73	6	.259
Note. ** = significant at .01 level				

Table 6 presented the results of data analysis using Chi-square test for association between psychological factors and the demographic profile of the learners. Based on the table, it shows that there is a significant relationship between the psychological factors that affect the numeracy of the learners and their geographic location ($\chi^2(4) = 37.24, p < .001$).

Geographic location interacts with social factors and cultural values. This could ultimately influence psychological aspects of numeracy learning. According to Gibbons et al. (2018), students from lower socio-economic backgrounds in certain geographic locations such as rural areas, might face challenges. Limited resources at home and potentially under-resourced schools can create a negative learning environment which may have significant impact on the learner's self-confidence, motivation, and math anxiety.

Other students view math as less useful (Tebbut, 1993). This perception may impact student beliefs in their numeracy potential. When it comes to the part of the teachers, teachers in under-resourced areas might have lower expectations to their students which can have impact in the learner's motivation and self-efficacy. In addition, limited resources and negative social messages can erode student confidence in their ability to learn math. This may lead to a decrease in motivation and engagement. Also, students from a disadvantage background might experience higher levels of math anxiety due to a combination of factors like limited exposure to math and lower self-confidence.

Table 7. Significant relationship among factors that affect the numeracy achievement of the students

Spearman's rho		Social Factors	Environmental Factors	Psychological Factors
Social Factors	Correlation Coefficient	1.000	.357	.465
	Sig. (2-tailed)		.000**	.000**
Environmental Factors	Correlation Coefficient	.357	1.000	.358**
	Sig. (2-tailed)	.000**		.000
Psychological Factors	Correlation Coefficient	.465	.358	1.000
	Sig. (2-tailed)	.000**	.000**	

N = 162. Note. ** significant at .01 level

There is a positive relationship between social factors and environmental ($r(160) = .36, p < .001$) and psychological ($r(160) = .47, p < .001$) factors that affect the numeracy skills of the students. In addition, there is also a positive relationship between environmental factors and psychological factors that affect the numeracy skills of the students ($r(160) = .36, p < .001$).

Social and environmental factors often interact. For instance, a positive classroom environment can encourage peer collaboration and participation, further enhancing numeracy development. In addition, there is an interplay between social and psychological factors when it comes to numeracy skills. For example, negative experiences in math class or social pressure from peers regarding math ability may contribute to math anxiety. Also, parental encouragement and positive reinforcement from teachers can build a student's self-efficacy in math which leads to greater motivation and engagement. Moreover, students with high intrinsic motivation for math are more likely to seek out positive social interactions related to math, like forming study groups. Low self-esteem can make students hesitant to participate in class discussions or ask questions about math, hindering social learning opportunities.

There are also interactions between environment and psychological factors. A classroom environment with constant pressure or lack of resources can contribute to math anxiety and hinders student ability to focus and learn. In addition, students with high self-efficacy and intrinsic motivation are more likely to seek out challenging tasks and persist when faced with difficulties in math environment.

Proposed Intervention Strategies based on the Findings of the Study

Based on the findings from the previous research questions, the following interventions are proposed to address the identified gaps:

1. Collaborative Engagement Program

- a. **Parent-Teacher Workshops.** Strengthen partnership with parents and teachers. Workshops where teachers and parents collaborate to understand effective strategies for supporting numeracy development at home and in school. Practical activities, resources for home practice, and communication strategies to maintain consistent support.
- b. **Positive Reinforcement Systems.** Foster supportive and encouraging learning atmosphere. Implement reward system for both effort and achievement in numeracy tasks. Certificates, small prizes, and public recognition for progress and participation, aimed at building students' confidence and motivation.

2. Confidence and Resilience Building Program

- a. **Mindfulness and Relaxation Techniques.** Reduce math anxiety and build emotional resilience. Incorporate mindfulness exercises, deep breathing techniques, and relaxation practice into a daily or weekly routine. Sort guided sessions that help students calm their minds, focus better, and approach math tasks with reduce anxiety.
- b. **Peer Mentoring and Support Groups.** Foster a supportive learning community and reduce feeling of isolation/ Establish peer mentoring program where older or more confident students mentor those who are less confident or struggling with math anxiety. Regular meetups for mentors and mentees to discuss challenges, share strategies, and provide mutual support.
- c. **Real-life Math Applications.** Make math relevant and engaging to build confidence and interest. Incorporate real-life scenarios and applications of math into the curriculum. Projects and activities that show how math is used in everyday life, careers, and hobbies, helping students see the value and applicability of their skills.

3. Technology-Enhanced Numeracy Program:

- a. **Teacher Training on Technology Integration.** Equip teachers with the skills to effectively integrate technology into their numeracy instruction. Conduct professional development workshops focused on using digital tools and resources for numeracy teaching. Training on how to use various educational technologies, best practices for incorporating them into lesson plans, and methods for assessing student progress using these tools.
- b. **Digital Collaboration Tools.** Foster collaboration and peer learning through technology. Use digital collaboration tools to facilitate group projects and peer-to-peer learning activities. Platforms like Google Classroom, Microsoft Teams, or similar tools where students can collaborate on numeracy projects, share ideas, and help each other solve problems.

RECOMMENDATIONS

- a. Schools and parents collaborate to create a supportive and positive learning environment. Teachers should receive professional development on effective numeracy teaching strategies and be encouraged to foster an engaging and encouraging classroom atmosphere. Schools should establish regular communication with parents to involve them in their children's learning process, providing resources and guidance on how to support numeracy development at home.
- b. Foster supportive and encouraging learning atmosphere. Implement reward system for both effort and achievement in numeracy tasks. Certificates, small prizes, and public recognition for progress and participation, aimed at building students' confidence and motivation.
- c. Teachers should introduce techniques such as deep breathing, mindfulness, or brief physical activities to help students manage stress and anxiety.
- d. Foster a supportive learning community and reduce feeling of isolation/ Establish peer mentoring program where older or more confident students mentor those who are less confident or struggling with math anxiety. Regular meetups for mentors and mentees to discuss challenges, share strategies, and provide mutual support.
- e. Make math relevant and engaging to build confidence and interest. Incorporate real-life scenarios and applications of math into the curriculum. Projects and activities that show how math is used in everyday life, careers, and hobbies, helping students see the value and applicability of their skills.
- f. Equip teachers with the skills to effectively integrate technology into their numeracy instruction. Conduct professional development workshops focused on using digital tools and resources for numeracy teaching. Training on how to use various educational technologies, best practices for incorporating them into lesson plans, and methods for assessing student progress using these tools.
- g. Offer professional development opportunities for teachers to effectively integrate technology into their numeracy instruction, utilizing digital tools and resources to enhance learning experiences.
- h. Facilitate partnerships between schools and families to support the use of technology at home, providing guidance and resources to parents on how to assist their children with numeracy development using technological tools.
- i. Foster collaboration and peer learning through technology. Use digital collaboration tools to facilitate group projects and peer-to-peer learning activities. Platforms like Google Classroom, Microsoft Teams, or similar tools where students can collaborate on numeracy projects, share ideas, and help each other solve problems.

PLANS FOR DISSEMINATION & UTILIZATION

Dissemination and utilization of research results are crucial in the achievement of learning outcomes, and in improving the teaching-learning and governance processes in schools, SDOs, ROs, and CO (DepEd Order No. 16, s. 2017). The researcher will disseminate and discuss the research results and recommendations to the school heads of DepEd Tandag City.

The completed research report will also be presented in the Division Research Congress to share research findings. The researcher will also submit the study for possible publication in a reputable international research journal for wider dissemination, and as a potential archival mechanism for completed research.

With the full support of the school heads of the division, teachers will disseminate and utilize the research proposed interventions through the existing mechanisms like Learning Action Cells (LACs).

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APPENDIX

Financial Report

Reflected below are the expenses to be detailed in the research which are appropriate and necessary in the conduct of the study.

Items	Unit	Quantity	Unit Cost	Total
Supplies and materials				
Bond paper A4	ream	4	P260.00	P1,040.00
Epson Ink	bottle	2	P350.00	700.00
Food during the conduct of research [surveys, FGD]				
Snacks	pax	200	50.00	10,000.00
				P11,740.00

Survey Questionnaire

Exploring the Impact of Social, Psychological, and Environmental Factors on Secondary Learners' Poor Numeracy Achievement

[N. Mendiola, EPS]

Please provide the following information:

Name/Codename of Respondent (optional): _____

Name of School: _____ Grade level: _____ District: _____

Part I – Demographic Profile of Learners: Please put a check [/] on the space provided.

Age: 11 _____

12 _____

13 _____

14 _____

15 _____

16 & above _____

Gender: Male: _____ Female: _____

Parent's Income monthly: P5,000 & below _____

P5,000 to 10,000 _____

P10,000 to 20,000 _____

P20,000 to 30,000 _____

P30,000 to 50,000 _____

P50,000 and above _____

Parental Education: Elementary: _____ High School: _____ College: _____

Geographic location: Urban: _____ Sub-urban _____ Rural: _____

Family Structure: Conjugal _____ Extended _____ Single parent _____ other _____

Access to technology: High _____ Moderate: _____ Low _____ None _____

Part II - Factors that contribute to the learners' poor numeracy achievement

SOCIAL FACTORS	4	3	2	1
a.1 Parental Involvement	Very much true [tinuod kaayo]	Mostly true [Kasagaran tinuod]	Slightly true [Medyo tinuod]	Not true at all [Dili tinuod]
a.1.1 My family's encouragement and support greatly contribute to my motivation to excel in numeracy skills				
a.1.2 My family's attitude toward numeracy skills has a noticeable impact on my own attitude and efforts				
a.1.3 My family actively engages in activities that help improve my numeracy skills outside of school				
a.2 Peer Interactions	Very much true [tinuod kaayo]	Mostly true [Kasagaran tinuod]	Slightly true [Medyo tinuod]	Not true at all [Dili tinuod]
a.2.1. Peer interactions play a significant role in motivating me to improve my numeracy skills				
a.2.2 I find that my friends' attitudes toward numeracy skills impact my own interest in mastering them				
a.2.3 Collaborative learning with peers helps me understand numeracy concepts better				
a.3 School Environment	Very much true [tinuod kaayo]	Mostly true [Kasagaran tinuod]	Slightly true [Medyo tinuod]	Not true at all [Dili tinuod]
a.3.1 Teachers who show genuine interest in helping me improve my numeracy skills inspire me to learn				
a.3.2 Teachers' teaching methods greatly affect my understanding and performance in numeracy				
a.3.3 I feel comfortable seeking help from my teachers when I struggle with numeracy concepts				

B. ENVIRONMENTAL FACTORS				
	Very much true [tinuod kaayo]	Mostly true [Kasagaran tinuod]	Slightly true [Medyo tinuod]	Not true at all [Dili tinuod]
b.1 Home Environment				
b.1.1 The availability of a quiet and suitable study space at home greatly impacts my ability to master numeracy skills				
b.1.2 Having access to educational resources (books, internet, materials) at home contributes significantly to my numeracy skill development				
b.1.3 The level of support and encouragement I receive from my family at home influences my motivation to improve numeracy skills				
b.2 School Environment				
b.2.1 The availability of well-equipped learning facilities (labs, study areas) at school affects my ability to practice and improve numeracy skills				
b.2.2 Teachers who actively promote the use of math-related resources contribute significantly to my numeracy skill development				
b.2.3 The support I receive from teachers at school impacts my motivation to excel in numeracy skills				
b.3 Technology Resources				
b.3.1 Access to digital devices (computers, tablets, smartphones) for practicing numeracy skills plays a significant role in my learning				
b.3.2 The availability of online resources (websites, apps) helps me improve my numeracy skills to a great extent				
b.3.3 Teachers who integrate technology into their numeracy lessons positively impact my understanding and engagement with the subject				

PSYCHOLOGICAL FACTORS				
c.1 Self Confidence & Attitude	Very much true [tinuod kaayo]	Mostly true [Kasagaran tinuod]	Slightly true [Medyo tinuod]	Not true at all [Dili tinuod]
c.1.1 Having a strong sense of self-confidence significantly enhances my ability to master numeracy skills				
c.1.2 A positive attitude toward numeracy skills greatly influences my motivation to improve them				
c.1.3 Believing in my own potential to excel in numeracy skills positively impacts my performance				
c.2 Math Anxiety & Stress	Very much true [tinuod kaayo]	Mostly true [Kasagaran tinuod]	Slightly true [Medyo tinuod]	Not true at all [Dili tinuod]
c.2.1 Experiencing anxiety or stress when dealing with math-related tasks negatively affects my ability to master numeracy skills				
c.2.2 Feeling anxious when performing numeracy activities in front of others hinders my performance				
c.2.3 Math anxiety often interferes with my understanding and learning of numeracy concepts				
c.3 Perceived Importance & Relevance	Very much true [tinuod kaayo]	Mostly true [Kasagaran tinuod]	Slightly true [Medyo tinuod]	Not true at all [Dili tinuod]
c.3.1 Recognizing the importance of numeracy skills for my future goals significantly motivates me to improve them				
c.3.2 Believing that numeracy skills are relevant to my daily life outside of school impacts my attitude toward mastering them				
c.3.3 Seeing the practical applications of numeracy skills in real-life scenarios influences my commitment to mastering them				

c.4 Learning Strategies & Study Habits	Very much true [tinuod kaayo]	Mostly true [Kasagaran tinuod]	Slightly true [Medyo tinuod]	Not true at all [Dili tinuod]
c.4.1 Using effective learning strategies (problem-solving, practicing) significantly contributes to my numeracy skill development				
c.4.2 Organizing and managing my study time effectively has a positive impact on my understanding of numeracy concepts				
c.4.3 Actively seeking help from teachers, peers, or resources when I struggle enhances my learning experience				

Thank you for completing the survey. Your input is valuable.