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## Barriers on Mathematics Performance Among Learners in West Districts of Cagayan De Oro City Division

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### ABSTRACT

This study examines barriers hindering Grade 5 learners' Mathematics performance in Cagayan de Oro City. It explores cognitive, affective, and societal challenges, their impact on academic outcomes, and the relationship between these barriers and learners' performance. Using a descriptive-correlational survey, data were collected from 200 students in West I and West II Districts through questionnaires and First quarter grades from the 2024–2025 school year. The findings reveal that societal factors, particularly limited resources, significantly hinder Mathematics performance, perpetuating unequal educational opportunities and poverty. These challenges impair cognitive skills like memory retention. Affective barriers, such as attitudes, motivation, and interest, were less influential but varied among individuals. While most students performed satisfactorily, those scoring 75–79 need targeted interventions to unlock their full potential. The study highlights the complexity of these interconnected barriers and calls for comprehensive strategies to enhance Mathematics education. Addressing resource shortages, improving memory retention techniques, and catering to individual learning needs are recommended to improve performance and foster better learning experiences. This approach aims to break down systemic barriers and empower students to excel in Mathematics.

### INTRODUCTION

As a Mathematics teacher, the researcher observed that her Grade 5 learners struggle with tasks like problem-solving and other exercises. She discovered that their difficulties in understanding the subject prevent them from fully engaging in activities. There are instances where, when reviewing the previous lesson, students seem to have forgotten what had been discussed the day before. Furthermore, some students are reluctant to take part in any related activities in class. This clearly affects their performance in Mathematics, creating a barrier that hinders their progress and obstructs their ability to grasp essential concepts.

Mathematics is one of the core subjects in Basic Education and requires a lot of practice and patience. Learning its concept is a very important skill required in today's technologically savvy age. Knowing its foundation makes it easier to do everyday tasks such as measuring, counting, organizing, navigating, and tasks that require calculation. However, despite its significance to real life, many students encounter barriers to developing a deep understanding of Mathematics, particularly during their formative years in elementary school.

Mathematics education is widely acknowledged as a complex undertaking (Brezavšček *et al.*, 2020; Bringula *et al.*, 2021). The frequent use of formulas and unfamiliar symbols tends to create obstacles for students, leading to the perception of Mathematics as a more arduous subject compared to others. Such a perception can adversely impact learners' overall performance in Mathematics. However, Mathematics plays a vital role

in both elementary and secondary education, equipping learners with fundamental knowledge and skills necessary for effectively managing various aspects of their lives (Ariyanti & Santoso, 2020).

The Philippines is facing a significant challenge in Mathematics education, as learners consistently perform below the average when compared to their international counterparts. The Trends in International Mathematics and Science Study (TIMSS) 2019 revealed that Filipino fourth-graders achieved markedly lower scores than their peers from other participating nations (Baclig, 2020). An analysis of the TIMSS data showed that merely 19% of Filipino learners attained the low benchmark, which indicates a fundamental understanding of mathematical concepts, while a concerning 81% failed to meet even this basic criterion (Magsambol, 2020). Furthermore, the results of the National Achievement Test (NAT) for Grade 6 students have demonstrated a worrying decline over the past three years, with the 2018 NAT score reaching a record low of 37.44, positioning students at the lowest level of mastery (Albano, 2019). These alarming statistics underscore the pressing need for the Department of Education (DepEd) to address the deteriorating quality of Mathematics instruction in the Philippines.

In response to this pressing issue, researchers are diligently investigating the elements that lead to learners' difficulties in Mathematics. A study conducted by Ginuocor *et al.* (2020) highlighted the importance of comprehending the challenges that hinder students' mathematical competence. Thus, this is the reason why

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the researcher wants to study the contributing barriers and their impact on academic performance among the learners in Cagayan de Oro City and investigate these difficulties and coping mechanisms that students had when studying Mathematics. These barriers encompass various forms ranging from cognitive developmental constraints, affective, and societal influences within the learning environment. The identification of these involves an extensive review of relevant studies and an examination of effective variables, particularly their impact on students' academic performance. The purpose of conducting this study is to enable learners to enhance their skills and performance in Mathematics.

## LITERATURE REVIEW

### Barriers

Barriers, as defined by the APA Dictionary (2018), are obstacles that restrict, impede, or hinder progress toward an ultimate goal or objective. In psychological contexts, barriers refer to mental, emotional, or behavioral limitations experienced by individuals and groups. Research by Smith and Johnson (2018) has highlighted a strong association between the existence of barriers in educational environments and decreased mathematical performance in students. Obina *et al.* (2022) highlight that the performance of learners in mathematics, both on a global and local scale, has emerged as a significant issue. Generally, learners exhibit poor performance in Mathematics, a subject that poses considerable challenges even in traditional classroom environments. Consequently, it is essential to examine the various factors that influence students' performance in Mathematics. Li *et al.* (2023) assert that both affective and cognitive elements play a crucial role in shaping learners' academic outcomes. The aptitude theory suggests that the assessment of aptitude encompasses not only cognitive aspects, such as motivation but also emotional components, including feelings, that impact academic performance. Therefore, a diverse array of interconnected factors spanning cognitive, affective, and social dimensions significantly affects an individual's mathematical performance.

### Cognitive Barriers

Cognitive barriers refer to specific thought processes regarding mathematical structures or objects that may be suitable in certain contexts but not in others (Herscovics, 2019). Nevertheless, Hunt *et al.* (2021) assert that in the realm of mathematical proficiency, cognitive barriers represent constraints in cognitive resources, including attention, language, and memory. These barriers emerge as obstacles in mental functioning and thought patterns, creating difficulties in knowledge acquisition and effective problem-solving.

### Attention and Concentration

Engaging in mathematics necessitates a significant level of focus, particularly when the problem-solving process involves multiple steps. Le (2022) emphasizes that

concentration is a relative concept that can be enhanced by modifying certain existing factors. Additionally, students' active involvement, fostered by positive interactions with instructors and bolstered by motivation, contributes to heightened concentration and improved learning outcomes.

Hariyanto (2021) remarked that when learners are genuinely attentive, they are more likely to engage effectively in educational activities. Attention not only influences a learner's participation in class but also has a profound impact on their academic performance. Learners who maintain strong concentration during lessons are better equipped to tackle questions related to the material, leading to higher scores and greater academic success. In a similar vein, Panulaya (2024) asserts that learners can engage with empathy and understanding when they are taught the art of listening, which can be effectively applied within the classroom environment. Furthermore, Pllana (2020) notes that learners' attention in class shapes the trajectory of their learning. A significant portion of the lesson may be perceived as manageable with active engagement, while other aspects may require additional time for analysis outside of class, such as through homework.

### Mathematics Language and Comprehension

Mathematics has a complex language of its own, complete with its own vocabulary and vernacular. To some learners, words like addend, divisor, quotient, factor, and denominator can seem intimidating. Not having a clear understanding of the concepts associated with these terms can hinder Mathematics performance. However, it is not just the terms unique to Mathematics that can trip up learners. A research article by Bulaon (2018) highlights that the terminology used in Mathematics often incorporates familiar English words, yet these terms are employed in contexts that differ from learners' usual experiences. Language is essential in the process of learning Mathematics. Certain English words can have entirely different meanings within a mathematical framework, leading to confusion among many learners. When educators lack a comprehensive understanding of mathematical language and its effective application in the classroom, learners frequently perceive the subject as perplexing and challenging, hindering their ability to grasp it thoroughly. Maluleka (2019) asserts that learners are likely to excel in Mathematics if they possess proficiency in the language utilized for teaching and learning, as this language facilitates their ability to articulate their comprehension of mathematical concepts.

### Memory Retention

The investigation by Mokhtar *et al.* (2019) in Malaysia underscored the difficulties learners face in comprehending keywords. Translating them into appropriate mathematical expressions, understanding mathematical concepts, grasping fundamental principles, and their hesitance towards complex questions. Similarly,

research from Indonesia, Sakilah *et al.* (2018) revealed that learners struggle with numeracy problem-solving, the placement of numerical values, and the identification of counting operation symbols. Additionally, the study indicated a general disinterest among students in tackling mathematical problems and honing their mathematical skills. Moreover, Preclaro's (2019) research on Filipino learners also pinpointed learning challenges associated with recalling mathematical facts, interpreting mathematical terminology, and addressing word problems. The study further clarified that learners faced hurdles in multiple facets of mathematics education, including understanding problems, selecting appropriate strategies, and employing effective problem-solving methods. According to Noyes and Adya (2020), cognitive barriers related to memory retention play a crucial role in students' performance in Mathematics. Their study indicates that learners often struggle to retain mathematical concepts due to the demands placed on working memory during problem-solving tasks. This difficulty can lead to an incomplete understanding and application of mathematical ideas, ultimately affecting their ability to perform well in assessments and class activities. Pillado *et al.* (2022) emphasize the critical role of memory retention in the academic success of learners. Learners experiencing challenges with retention may struggle to recall lecture content and may find it difficult to solve mathematical problems that require a sequence of steps. Also, Podila (2019) posits that concentration and memory are intrinsically linked. Effective concentration in the classroom is essential for learners to memorize the material. Conversely, even if a learner possesses strong concentration skills, the absence of memory can render those skills ineffective.

#### **Affective Barriers**

Hunt *et al.* (2021) describe affective barriers as emotional responses that can impede an individual's capacity to effectively learn and apply Mathematics, with Mathematics anxiety being the most prevalent example. These emotional processes originate in the limbic system, which plays a crucial role in shaping an individual's emotional behavior and influencing learning outcomes (Hannula, 2006; Pina *et al.*, 2021). Additionally, Szűcs and Mammarella (2020) emphasize that emotional factors are frequently neglected as potential contributors to specific learning difficulties. When such emotional challenges manifest during the mathematical learning process, they can serve as obstacles to performance, potentially disheartening students who possess strong mathematical abilities from pursuing further learning in the subject.

#### **Attitude Towards Mathematics**

The research conducted by Tamayo (2021) indicates a strong correlation between attitude and performance, particularly in the context of Mathematics. It was found that learners who maintain a positive attitude and disposition toward Mathematics tend to perform

better, which is reflected in higher grades. This finding underscores the significance that learners place on Mathematics, recognizing its value not only in their academic pursuits but also across various aspects of life. In a separate study, Chen *et al.* (2018) explored the relationship between learners' attitudes toward Mathematics and their academic success in the subject through the use of functional MRI. By examining the neural mechanisms of 75 American learners, the researchers discovered that a positive attitude towards Mathematics was associated with an increased reliance on memory-based strategies, resulting in more frequent memory retrieval and, consequently, improved Mathematics achievement. This suggests that learners' attitudes play a pivotal role in their cognitive development, influencing their ability to acquire mathematical knowledge and skills. Negative feelings or attitudes towards Mathematics can significantly hinder the development of mathematical literacy and impede learners' interest in the subject. Mata *et al.* (2019) found that attitudes and behaviors towards Mathematics significantly affect learners' performance in the subject. Learners with a negative attitude towards mathematics are more likely to experience anxiety and disengagement during mathematical tasks, leading to poorer performance.

#### **Motivation and Interest Towards Mathematics**

Motivation plays a crucial role in enabling learners to attain a more profound comprehension of mathematical concepts while also fostering their ability to employ mathematical reasoning for drawing conclusions and resolving problems. Sasson (2019) defines a deficiency in motivation as an inadequate level of desire and enthusiasm for engaging in a task. Additionally, motivation enhances the acquisition of information and facilitates learning. It is equally important to be aware of the lesson objectives, the teaching methods employed, and the learning activities utilized in the classroom, as these are all motivational elements that contribute to memory retention (Field, 2018).

#### **Societal Barriers**

Hunt *et al.* (2021) define social barriers as the inequalities that arise among individuals within a society. These disparities stem from various factors, including socioeconomic status, religion, race, ethnicity, and gender. The culture of a community plays a significant role in the formation of social barriers, which are further shaped by the behaviors of its members. Key components of social barriers encompass socioeconomic conditions, access to resources, and prevailing societal attitudes.

#### **Teachers' Attitudes**

The term teacher's behavior refers to the observable actions associated with the teaching process aimed at facilitating student learning, whether for an individual or a group. This concept includes all verbal and nonverbal interactions exhibited by a teacher in the context of education within a classroom environment. It has

been observed that the various teaching methods and strategies employed by different educators yield diverse outcomes in learner performance. As the primary guides for students, teachers are encouraged to be innovative in cultivating these behaviors, utilizing suitable methods, approaches, and strategic pedagogies (Syamsuddin *et al.*, 2021). teacher's approachable demeanor can significantly resonate with learners. A teacher's ability to positively influence student character is greatly enhanced by maintaining a constructive attitude (Gundaya, 2023).

According to Rashid (2018), teachers play a crucial role in fostering a supportive learning atmosphere that enables learners to achieve academic success. Consequently, a significant responsibility for ensuring quality education rests on the teacher's personality and attitude. Furthermore, Anyagh *et al.* (2018) suggest that learners' learning in Mathematics is profoundly affected by the teacher's actions and inactions which can lead to negative attitudes towards the subject. The study recommends that student evaluations of their teachers' instructional methods should be regarded as a vital tool for assessing teaching effectiveness.

### Teaching Methods and Teaching Style

In the realm of education, teaching styles represent a critical component, as they significantly influence students' knowledge, skills, and attitudes. The effectiveness of teaching styles varies across different subjects. According to Karunanayake *et al.* (2020), teaching styles, often referred to as teaching methods, encompass the overarching principles and management strategies employed in classroom instruction. These styles are intrinsically connected to a teacher's educational values and are derived from their educational philosophy. Understanding one's teaching style can enhance instructional methods, foster greater learner engagement, and ultimately improve student outcomes. Nevertheless, the selection of teaching styles may also be influenced by the school's mission statement, the demographics of the classroom, the teacher's educational philosophy, and, crucially, the specific subject matter. Furthermore, given that learners possess diverse learning preferences, it is essential for educators to adapt their approaches to accommodate various learning styles, particularly in the context of teaching mathematical reasoning (Dewi *et al.*, 2019).

### Limited Resources

As noted by Jay *et al.* (2018), the availability of educational resources and activities at home, such as books, music, and discussions about everyday occurrences, correlates with enhanced performance in Mathematics among children. Dewi *et al.* (2019) emphasize that the absence of appropriate teaching aids and materials can hinder teachers' ability to effectively convey mathematical concepts and nurture mathematical reasoning. A lack of adequate training and support may prevent teachers from addressing the diverse needs of individual learners and facilitating their mathematical growth. Given that learners

have varied learning preferences, it is essential for educators to adapt their teaching methods to accommodate these differences in order to effectively impart mathematical reasoning. Each student processes and retains information uniquely, complicating the implementation of a uniform teaching strategy. Ultimately, it is crucial to equip learners with the essential tools and resources necessary for comprehending and applying mathematical concepts. This encompasses textbooks, calculators, and various visual aids. By supplying these resources, learners are better positioned to grasp and utilize reasoning skills, as highlighted by Mamun *et al.* (2020).

### Statement of the Problem

The study aimed to examine the perceived barriers to Mathematical Performance among Grade 5 learners in West I and West II Districts, Division of Cagayan de Oro, for School Year 2024-2025. Particularly, this paper sought to answer the following questions:

1. What is the respondents' level of mathematical barriers in terms of cognitive as to attention and concentration, Mathematics language and comprehension and memory retention; affective as to attitude towards Mathematics and motivation and interest; and societal as to teachers' attitude, teaching method and teaching style and limited resources?
2. What is the academic performance of Grade 5 learners in Mathematics for the First Quarter of the School Year 2024-2025?
3. Is there a significant relationship between the barriers and the learners' academic performance in Mathematics for the First Quarter of the School Year 2024-2025?

### Theoretical Framework

Barriers to learning Mathematics can be grouped into three main domains: cognitive, social and affective (Immordino-Yang, 2011). This study is anchored to the following theories: Piaget's Theory (1971). Provides a lens through which to understand how cognitive processes shape mathematical understanding. Cognitive theories are centered on the acquisition, processing, and retention of knowledge by individuals. In the realm of understanding Mathematics, cognitive theories delve into aspects such as problem-solving techniques, memory, reasoning skills, and the evolution of mathematical concepts and proficiencies. The study of cognitive theory and its application to learning Mathematics has progressed significantly since Piaget's time. Numerous research studies have been conducted to showcase the consistent connections between different cognitive capacities and mathematical skills.

Social Constructivism Theory (Vygotsky, 1978) places the child in an active role in the learning process. Learning is not swallowed whole, but lesson material is modified and transformed based on the child's cognitive structures, social interaction, previous learning, and environment. The adaptation of constructivist learning theory denotes the idea of the zone of proximal development, a principle

of constructivism that emphasizes a learner's ability to perform simple tasks when working with the teacher, parent, or capable peer and what a learner can do without assistance. Social constructivism regards individual learners and the realm of the social as indissolubly interconnected. Human beings are formed through their interactions with each other as well as by their individual processes. Thus, there is no underlying model for the socially isolated individual mind.

In addition, the Affective Theory (McLeod, 1989) referred to it as a broad range of feelings and moods that are generally considered to be different from pure cognition, including as specific components, attitudes, beliefs, and emotions. He points to two categories of beliefs that seem mainly to influence Mathematics learning: beliefs about Mathematics that generally involve no major affective component but do constitute an important part of the context in which affect develops and the learners' (and the teacher's) beliefs themselves and how they relate to Mathematics. The latter have a strong affective component, including beliefs concerning confidence, self-concept, and the attribution of causes to academic success and failure.

McLeod (1991) focuses on the emotional dimension of learning and how emotions can impact cognition and behavior in educational settings. It suggests that emotions play a crucial role in the learning process and can influence how individuals perceive, process, and retain information. Identified three concepts used in the research on affect Mathematics education: beliefs, attitudes, and emotions. He made distinctions among these and described emotions as the most intense and least stable, beliefs as the most stable and less intense, and attitudes as somewhere in between on both dimensions. Beliefs were seen as the most 'cognitive' and emotions. He differentiates four axes relating to beliefs: Mathematics (the object), oneself, Mathematics teaching, and the context in which Mathematics education takes place (social context).

### Limitations

The respondents of the study were the Grade 5 learners in the West I and West II Districts of Cagayan de Oro. The scope of the investigation was focused on a multifaceted exploration of perceived barriers that hinder Mathematics performance among the learners in the study setting. A survey questionnaire was given to the intended student target population, and this was used to gather quantitative data. Furthermore, this survey was sent out to get a sense of how students view the obstacles regarding cognitive that are focused on the three components: attention and concentration, Mathematics language and comprehension and memory retention. Affective barriers focused on the attitudes and behaviors related to Mathematics, as well as the levels of motivation and interest. In contrast, societal barriers encompassed the attitudes and behaviors of teachers, their teaching methods and styles, and the availability of resources. These factors have been

identified to provide a more thorough understanding of the challenges faced and their impact on mathematical performance.

To find connections between various barriers and Mathematics performance outcomes, the investigation made use of statistical approaches, including correlation. The findings of this research endeavor aimed to contribute valuable insights into the complex dynamics of barriers affecting Mathematics performance among learners in Cagayan de Oro City. Notwithstanding the extensive scope of this study, it is important to recognize its limitations, such as the demographic and educational context under study, the student's experience and perception despite the reliability and validity of the survey questionnaire, and other external factors like time constraints and resource limitations, the comprehensiveness and scope of the research. Likewise, the setting was focused solely on the two big and medium schools in the West I and West II Districts in Cagayan de Oro City. Big schools typically employ one hundred or more teachers, while medium-sized schools have between thirty (30) and fifty (50) teachers.

## MATERIALS AND METHODS

### Research Design

The research utilized the descriptive-correlational survey, which involved the description, recording, analysis, and interpretation of conditions that existed at the time that the research was conducted. It is descriptive in the sense that this study gathered information about the contributors to barriers to mathematical understanding and described the correlation to Mathematics performance. It is also correlational because this study determined the relationship between contributory variables such as the extent of students' cognitive, affective, and societal variables as to barriers to performance in Mathematics. The independent variables are the respondents' cognitive, affective, and societal barriers. The performance in Mathematics supported by the First Quarter grade of the School Year 2024-2025 as the dependent variable. A self-response quantitative questionnaire survey was designed to collect data from selected Grade 5 learners of the schools in West I and II Districts. The data were collected directly from the subjects via questionnaire. This study included quantitative analysis from the questionnaire, aiming to get factual, accurate, and systematic data by gathering averages, frequencies, and other similar statistical calculations.

### Study Setting

The public elementary schools in the West Districts of Cagayan de Oro City offer a lot of educational opportunities. These schools, situated between bustling streets and beautiful areas of greenery, serve as learning centers, inviting kids from a variety of backgrounds and communities. Each school has a unique architectural imprint, ranging from modern to colonial-era structures that represent the city's rich history. Within these hallowed

halls, the echoes of children’s laughter combine with the hum of learning, creating an environment conducive to academics.

Schools in this area offer a complete basic education from preschool to Grade 6. Each has its own unique characteristics and strengths. They have distinctive qualities and reign competitively in academics, journalism, and sports. These schools serve a varied population of pupils who come from both urban and rural communities. The infrastructure varies from modern buildings equipped with state-of-the-art facilities to more modest structures that reflect the limitation of resource allocation. Despite this, teachers are committed and advocate for teaching and achieving holistic development for these learners. Furthermore, schools in the West Districts frequently represent Cagayan de Oro City’s cultural variety with programs and activities that promote local heritage and traditions. This cultural diversity enriches the educational experience by instilling a sense of pride and identity in the students.

West District public elementary was divided into two, the West I District having seven schools catering to the educational needs of students in various barangays within the Carmen area. Notable schools included in the study are Macanhan Elementary School for medium school, situated in Macanhan, Carmen and West City Central School, for big school, which is located in Ilaya Carmen, the second largest school in Cagayan de Oro City. Whereas, West II District encompasses eight schools with a diverse range of public elementary schools, each catering to the educational needs of students in different barangays within the western part of Cagayan de Oro City. West II District schools included in the study was Bulua Central School for big schools, which is situated in Bulua. This school is near the highway, and Iponan Elementary School for medium schools, which is located in Barangay Iponan of Cagayan de Oro City.

### Study Population and Sampling Technique

The study was focused on the Grade 5 learners of West I and West II Districts of Cagayan de Oro City for the School Year 2024-2025. Specifically, two hundred participants (200) from the following big and medium schools, namely: West City Central School and Bulua Central School, have seventy-seven (77) respondents. Meanwhile, the medium schools Macanhan Elementary School and Iponan Elementary School have twenty-three (23) respondents. The selection process ensured that each member of the population had an equal chance of becoming part of the sample. The table below shows the distribution of respondents by school.

In this study, stratified random sampling was employed to have a systematic representation of Grade 5 learners from different sections in big and medium schools in West I and West II Districts of Cagayan de Oro City with a total population of 1662 Grade 5 learners. Thus, a sample size of two hundred (200) participants was obtained and selected. In investigating the barriers to mathematical

understanding that affect mathematical performance, the researcher divided the student population according to stratum based on factors such as sectioning. By randomly selecting a proportional number of students from each stratum, the sample accurately reflected the diverse student population and minimized bias. Also, to ensure a variety of ideas was represented within the target population and to get the sample size of the target population.

**Table 1:** Distribution of Respondents per School

Schools	Population	Sample Size
Big		
West City Central School	608	77
Bulua Central School	550	77
Medium		
Macanhan Elementary School	245	23
Iponan Elementary School	259	23
<b>Total</b>	<b>1662</b>	<b>200</b>

### Research Instruments

This type of research utilized a descriptive questionnaire patterned and modified from the study of Hunt *et al.* (2021) entitled Socio-Cognitive-Affective Barriers to Mathematics Education in Developing Nations, but the indicators are researcher-made. The whole questionnaire was presented to the two experts in the field of Mathematics and two principals for content validity and cross-checking if the items were aligned with the specific problem of the study. The two large and medium-sized schools in Cagayan de Oro City’s West I and West II Districts received survey questionnaires as part of the quantitative phase of the study. Questionnaires were divided into two parts:

Part 1. The first part of the survey is a patterned and modified questionnaire to mathematical performance that deals with the cognitive barriers that learners face. It has three components: memory retention, mathematics language and comprehension, and attention and concentration. Each component has ten indicators. The second is the affective barrier, which has two variables: motivation and interest, each with ten indications, and attitude and behavior toward mathematics. The third is the social barrier, which has three variables: the attitude of the teacher, the teaching approach and style, and the lack of resources. Each of these elements has ten indicators. Their performance in Mathematics is influenced by these factors. The four-point rating system goes from 4 - At all Times to 1- Never.

Part 2. To obtain scores in Mathematics performance, the researcher was able to obtain the respondents’ grades for the First Quarter of the School Year 2024-2025 from their Grade 5 advisers, who were included in the study. Relevant to assessing Mathematics performance, it follows the DepEd Order No. 8, s. 2015, on the Policy

Guidelines on Classroom Assessment for the K to 12 Basic Education Program, which breaks down student grading into three main categories: written works, performance tasks, and quarterly assessments make up this curriculum. Each component has a varied weight percentage assigned to each subject. According to Section 8 of this DepEd Order, assessment should support learning objectives and guide the development of classroom procedures.

**Statistical Treatment of Data**

In this study, the researcher employed rigorous statistical analyses to investigate the relationship between barriers and their impacts on learners’ performance in Mathematics. Descriptive statistics were utilized to summarize the frequency and nature of various barriers reported by two hundred (200) respondents selected from different schools. This study calculated the weighted mean and standard deviation of student responses to a questionnaire about barriers to math understanding the cognitive, affective, and societal. Standard deviation also measured student performance on the First Quarter Mathematics grades. T-tests and ANOVAs assessed the significance of performance differences among groups with varying barriers. Correlation analysis examined the relationship between barriers and math performance. Multivariate analysis controlled for confounding variables and assessed the independent impact of barriers on performance. This comprehensive statistical approach revealed the complex interplay between barriers and math performance, offering valuable insights for educators and policymakers to improve student outcomes.

**Ethical Consideration**

Ethical considerations were paramount throughout this research project. Prior to data collection, informed consent was obtained from all participants, ensuring they fully understood the study’s purpose, procedures, potential risks and benefits, and their right to withdraw at any time without penalty. This process included providing detailed information in accessible language and utilizing separate consent forms tailored to the specific roles of parents and learners. Data collected was anonymized and securely stored, adhering to relevant data protection regulations and minimizing the risk of identifying information being disclosed. Confidentiality was maintained throughout the research process, with access to data restricted to the research team only. The study design itself was carefully considered to minimize any potential harm to participants. Ethical approval was sought and obtained from the relevant institutional committee prior to the commencement of the study, and all research activities were conducted in accordance with the approved protocol. Furthermore, the dissemination of research findings was carefully planned to avoid any potential harm to participants or compromise their confidentiality. Ethical clearance was obtained prior to the conduct of the study, effective from July 05, 2024 to July 05, 2025. This ensures that the research design, data collection methods, and participant recruitment strategies comply with ethical guidelines.

**RESULTS AND DISCUSSION**

**Problem 1. What is the Respondents’ Level of Mathematical Barriers in Terms of Cognitive as to Attention and Concentration, Mathematics Language and Comprehension and Memory Retention; Affective as to Attitude Towards Mathematics, Motivation and Interest; Societal As to Teachers’ Attitude, Teaching Method and Style, and Limited Resources?**

**Table 2:** Summary of Respondents’ Level of Mathematical Barriers in terms of Cognitive

Variables	Mean	SD	Interpretation
Attention and Concentration	2.99	0.77	High
Math Language and Comprehension	3.07	0.74	High
Memory Retention	3.31	0.76	Very High
<b>Overall</b>	<b>3.12</b>	<b>0.76</b>	<b>High</b>

*Legend:*

- 3.26-4.00 *At all Times / Very High*
- 2.51-3.25 *Most of the Time / High*
- 1.76-2.50 *Sometimes / Low*
- 1.00-1.75 *Rarely / Very Low*

Table 2 presents the summary of mathematical barriers in terms of cognitive with an overall mean of 3.12 (SD = 0.76), interpreted as High. This means that these cognitive difficulties might stem from the abstract nature of mathematical concepts, which require strong problem-solving and analytical thinking skills. Such barriers could prevent students from fully grasping mathematical ideas, leading to gaps in knowledge and understanding. It indicates that addressing cognitive barriers is critical to improving students’ mathematical performance. The high frequency of these issues points to a need for instructional approaches that better support cognitive functions, such as enhancing attention, promoting active engagement, and reinforcing memory retention through repetition and application.

As observed, learners may struggle with maintaining focus during math lessons, comprehending new concepts, or retaining learned information over time. These barriers could slow their progress, reduce confidence, and lead to increased anxiety surrounding math-related tasks and assessments. As perceived, these cognitive challenges highlight the importance of individualized support for students, as different learners may struggle with various aspects of mathematics. By identifying specific cognitive barriers, educators can tailor interventions to help students overcome these challenges and improve their overall academic achievement.

Geary (2020) identifies cognitive barriers as a significant factor influencing students’ performance in mathematics. These barriers often arise from limitations in working memory, processing speed, and executive functioning, all of which are essential for effectively manipulating and retaining mathematical concepts. Geary’s study found that students with weaker cognitive abilities in

these areas tend to struggle with tasks requiring multi-step problem-solving or the retention of complex mathematical information, ultimately impacting their overall mathematical achievement.

In line with this, the variable Memory Retention got the highest mean of 3.31 (SD = 0.76), interpreted as Very High. This means that effective instructional strategies may be in place to enhance students' ability to retain mathematical information. This could include techniques such as spaced repetition, active engagement during lessons, and opportunities for practice, which collectively help reinforce learning and support long-term retention. It indicates that memory retention is a critical factor in students' overall success in Mathematics. A high level of retention can facilitate smoother transitions between mathematical concepts and improve problem-solving skills, as students can draw upon previously learned information when encountering new challenges.

As observed, strong performance in memory retention could lead to increased confidence among students when tackling mathematical tasks. This confidence may encourage a positive attitude toward learning Mathematics, potentially resulting in greater participation in class and a willingness to engage with more complex material. As perceived, the emphasis on memory retention may reflect a broader trend within the educational system that values the ability to recall information as a key component of academic success. While this focus is important, it is crucial to balance memorization with deeper understanding, ensuring that students not only remember mathematical concepts but also comprehend their applications and relevance.

Passolunghi *et al.* (2020) emphasize the critical role of memory retention in mathematical achievement, highlighting that weaknesses in this area pose substantial cognitive challenges for learners. Their research underscores the direct impact of poor memory retention, particularly in working memory, on students' ability to recall essential mathematical knowledge, including facts, formulas, and procedures. This deficiency often manifests as difficulties in solving multi-step problems, where the retention of intermediate steps and results is crucial. Consequently, students may experience frequent errors and reduced performance in such tasks.

On the other hand, the variable Attention and Concentration got the lowest mean of 2.99 (SD = 0.77), interpreted as High. This means that learners exhibit a relatively strong level of attention and concentration in Mathematics, as indicated by the mean. While this score reflects positive engagement in learning, it is still the lowest among the cognitive barriers assessed, suggesting that there is room for improvement in maintaining focus. This suggests that while students are generally attentive during mathematics lessons, there may be occasional lapses in concentration that could hinder their ability to grasp complex concepts fully. Factors such as classroom distractions, instructional pace, or the nature of the mathematical content may contribute to these

fluctuations in attention.

As observed, learners may find it difficult to sustain their concentration for extended periods, particularly in longer math sessions or when encountering particularly abstract or difficult material. This variability in attention may impact their ability to engage deeply with mathematical concepts and perform well on assessments. As perceived, the challenges related to attention and concentration highlight the importance of creating a conducive learning environment that minimizes distractions and encourages active participation. Students may benefit from strategies that promote mindfulness, breaks during lessons, or varied instructional methods to sustain engagement.

Gathercole *et al.* (2020) stressed the importance of attention and concentration as crucial cognitive skills that significantly impact mathematical performance. Their study reveals that students who struggle to maintain focus during mathematical tasks often face challenges in problem-solving and following complex mathematical procedures. Attention deficits can lead to increased errors, as students may miss key details or fail to fully understand problem instructions, resulting in lower overall mathematical achievement.

Hariyanto (2021) remarked that when learners are genuinely attentive, they are more likely to engage effectively in educational activities. Attention not only influences a learner's participation in class but also has a profound impact on their academic performance. When learners maintain strong concentration during lessons, they are better equipped to tackle questions related to the material, ultimately leading to higher scores and greater academic success. Le (2022) emphasizes that concentration is a relative concept that can be enhanced by modifying certain existing factors. Additionally, students' active involvement, fostered by positive interactions with instructors and bolstered by motivation, contributes to heightened concentration and improved learning outcomes.

**Table 3:** Summary of Respondents' level of Mathematical Barriers in terms of Affective

Variables	Mean	SD	Interpretation
Attitude Towards Mathematics	3.12	0.71	High
Motivation and Interest	2.96	0.66	High
<b>Overall</b>	<b>3.04</b>	<b>0.69</b>	<b>High</b>

Legend:

3.26-4.00 *At all Times / Very High*

2.51-3.25 *Most of the Time / High*

1.76-2.50 *Sometimes / Low*

1.00-1.75 *Rarely / Very Low*

Table 3 presents the summary of mathematical barriers in terms of affective with an overall mean of 3.04 (SD = 0.69), interpreted as High. This means that students generally experience significant affective barriers when

it comes to Mathematics. These affective barriers could relate to their emotions, attitudes, and motivation toward the subject, which might hinder their overall performance in Mathematics. It implies that emotional factors such as anxiety, stress, or a lack of confidence play a critical role in how students engage with Mathematics. This level of affective challenge could contribute to students feeling less motivated or interested in the subject, affecting their willingness to participate and perform well.

As observed, many students likely approach Mathematics with hesitation or discomfort, perhaps due to past negative experiences or a general perception that math is difficult or irrelevant. These affective barriers create emotional distance between the students and the subject, making it harder for them to fully embrace learning opportunities. As perceived, students' emotional and attitudinal struggles with mathematics are pervasive and may stem from a variety of sources, including fear of failure, lack of interest, or low self-esteem regarding their mathematical abilities. These affective barriers are not only situational but seem to be a recurring challenge for students.

Goetz *et al.* (2020) emphasized the crucial role of affective factors, such as emotions, attitudes, and motivation, in shaping students' mathematical performance. Their findings suggest that negative emotions, particularly anxiety and frustration, can significantly impede student engagement and overall achievement in mathematics. Students experiencing high levels of math anxiety may exhibit avoidance behaviors, such as refusing to participate in class, neglecting assignments, and struggling during assessments. This emotional barrier can create a vicious cycle, leading to lower performance and heightened anxiety, further reinforcing negative feelings towards mathematics.

In line with this, the variable Attitude Towards Mathematics, got the highest mean of 3.12 (SD = 0.71), interpreted as High. This means that students generally exhibit a significantly high level of barriers related to their attitude towards Mathematics. This implies that how students perceive Mathematics and their approach to engaging with it are influential factors in their learning experience. It indicates that there is a notable correlation between students' attitudes and their success in Mathematics. A high mean in this area points to attitudinal barriers as a major challenge for students, potentially limiting their capacity to fully engage with or enjoy Mathematics. These barriers could stem from fear of failure, past negative experiences, or a lack of confidence in their abilities. As observed, students' behaviors and attitudes toward math may contribute to a cycle of disengagement, where negative feelings about the subject lead to less participation and lower achievement, which further reinforces their negative outlook. Such patterns are often difficult to break without targeted intervention. According to Batanero *et al.* (2020), students' attitudes and behaviors toward Mathematics play a crucial role in their overall performance in the subject. Their research

indicates that positive attitudes, characterized by enthusiasm and interest in Mathematics, correlate with higher achievement and engagement levels. Conversely, negative attitudes, such as avoidance or fear of failure, often lead to a lack of effort and lower performance outcomes. The study emphasizes that fostering a positive attitude toward Mathematics is essential for helping students overcome barriers and achieve better results.

On the other hand, the variable Motivation and Interest, got the lowest mean of 2.96 (SD = 0.69), interpreted as High. This means that many students are engaged with Mathematics, but there are still barriers to maintaining consistent enthusiasm and effort. This might be due to the perceived difficulty of the subject or a lack of connection between the material and students' real-world experiences. Students may show motivation at times but may lose interest when they encounter challenging topics or when lessons are not engaging enough. It indicates that while motivation and interest exist, they are not sustained at an optimal level. Students may be motivated when the material is presented in an interesting or accessible way, but they might struggle to maintain that interest when faced with more abstract or complex mathematical concepts. As observed, students' motivation and interest may peak during interactive or practical lessons but tend to drop when lessons become more theoretical or require abstract thinking. This implies that students' intrinsic motivation might not be fully developed, and their interest might rely heavily on external factors such as teacher enthusiasm, peer influence, or rewards.

Cavanagh *et al.* (2021) underscore the importance of motivation and interest as critical affective factors that significantly impact students' performance in mathematics. Their research indicates that students who possess intrinsic motivation, characterized by a genuine interest in learning and understanding mathematical concepts, tend to achieve higher academic success.

**Table 4:** Summary of Respondents' level of Mathematical Barriers in terms of Societal

Variables	Mean	SD	Interpretation
Teachers' Attitude and Behavior	3.12	0.71	High
Teaching Method/ Teaching Style	3.10	0.61	High
Limited Resources	3.40	0.78	Very High
<b>Overall</b>	<b>3.21</b>	<b>0.78</b>	<b>High</b>

Legend:

3.26-4.00 *At all Times / Very High*

2.51-3.25 *Most of the Time / High*

1.76-2.50 *Sometimes / Low*

1.00-1.75 *Rarely / Very Low*

Table 4 presents the summary of mathematical barriers in terms of societal with an overall mean of 3.12 (SD = 0.78), interpreted as High. This means that students frequently encounter societal challenges that affect

their performance and attitudes toward Mathematics. This implies that these external factors—beyond the students' control—consistently create obstacles in their learning process. Addressing these societal barriers could enhance students' learning experiences and outcomes in Mathematics. It indicates that the educational environment, including teachers' instructional methods and available resources, plays a crucial role in either supporting or hindering students' mathematical development. Societal factors such as teaching style, classroom atmosphere, and access to technology all impact how students interact with and understand mathematical concepts.

As observed, students may be struggling with societal factors that consistently impact their motivation, comprehension, and performance in Mathematics. The high score reflects that societal issues are a persistent challenge, affecting students' ability to focus, engage, and excel in Mathematics. Teachers' instructional styles and resource limitations could be contributing to this challenge. As perceived, students may feel that they are not receiving adequate support or encouragement from the societal aspects of their educational experience. This could manifest in feelings of frustration or disinterest, particularly if they feel that the methods used by their teachers or the resources provided do not meet their learning needs.

According to Amato *et al.* (2022), societal factors significantly impact students' performance in Mathematics. Their study emphasizes that students often face barriers arising from their socio-economic backgrounds, including limited access to educational resources, inadequate support from families, and societal attitudes towards Mathematics. These factors can lead to a negative perception of Mathematics as a subject, thereby affecting learners' motivation and engagement.

In line with this, the variable Limited Resources, got the highest mean of 3.40 (SD = 0.78), interpreted as Very High. This means that addressing resource limitations should be a priority for educational institutions. The very high interpretation indicates that students frequently encounter challenges due to insufficient materials, technology, or learning aids that are necessary for effective Mathematics instruction. This situation may contribute to decreased motivation and interest in the subject, impacting students' academic performance. It indicates that resource availability plays a crucial role in shaping students' perceptions and engagement with Mathematics. The consistent mention of limited resources suggests that students may find it difficult to explore mathematical concepts deeply or apply their knowledge in practical contexts. This lack of resources can lead to feelings of frustration and hinder students' ability to achieve their learning goals.

As observed, students are likely facing obstacles due to the inadequacy of resources, which can limit their interaction with mathematical content. The high score highlights the persistent challenges students encounter in accessing materials that facilitate effective learning. This

limitation may also contribute to increased anxiety and stress surrounding Mathematics, further impacting their academic outcomes.

According to Bicer *et al.* (2019), limited resources in educational settings are a significant barrier to effective Mathematics learning. Their research highlights that the lack of access to textbooks, technological tools, and supplementary learning materials can hinder students' ability to engage fully with mathematical concepts. When students are unable to access necessary resources, their performance in Mathematics often declines, as they cannot practice or apply the concepts being taught effectively.

On the other hand, the variable Teaching Method/ Teaching Style got the lowest mean of 3.10 (SD = 0.61), interpreted as High. This means that while the current teaching methods are somewhat effective, they may not fully meet the diverse needs of all students. This indicates that students appreciate their teaching style but also signals that it may lack sufficient engagement or adaptability to cater to different learning preferences. Therefore, educators should consider integrating more varied instructional strategies to create a more inclusive learning environment. It indicates that students generally feel positively about the teaching methods used in their Mathematics classes; however, there may still be underlying concerns about their effectiveness in promoting deep understanding and engagement. This suggests that while the approaches are functional, they may not completely foster a stimulating or interactive learning atmosphere, which is essential for student success in mathematics.

As observed, the teaching methods and styles currently utilized might not provide enough opportunities for active participation and hands-on learning. Although the mean score is high, it reflects a potential gap in the ability of these methods to inspire students fully or encourage them to explore mathematical concepts creatively. This observation highlights the importance of continually assessing and evolving teaching practices to better support student engagement.

According to Dembélé and Miannay (2019), the teaching methods and styles employed in Mathematics classrooms significantly influence students' performance and attitudes toward the subject. Their research indicates that traditional teaching approaches, which often focus on rote memorization and passive learning, can create barriers for students, particularly those who struggle with mathematical concepts. These methods fail to engage students actively and do not accommodate diverse learning styles, resulting in a lack of understanding and increased anxiety regarding Mathematics.

Table 5 presents the summary of respondents' level of mathematical barrier with an overall mean of 3.12 (SD = 0.74), interpreted as High. This means that the perceived barrier in Mathematics among the study participants is in high level. This implies that, on average, individuals perceive a high level of obstacles in their learning and engagement in the subject. However, this implies the

**Table 5:** Summary of Respondents Level of Mathematical Barrier

Barriers	Mean	SD	Interpretation
Cognitive	3.12	0.76	High
Affective	3.04	0.69	High
Societal	3.21	0.78	High
<b>Overall</b>	<b>3.12</b>	<b>0.74</b>	<b>High</b>

Legend:

3.26-4.00 At all Times / Very High

2.51-3.25 Most of the Time / High

1.76-2.50 Sometimes / Low

1.00-1.75 Rarely / Very Low

importance of recognizing individual differences in how people experience and perceive barriers in Mathematics, which are influenced by a range of factors, namely cognitive, affective and societal barrier. Furthermore, this significantly implies designing an effective intervention addressing not only cognitive deficits but also the social and emotional factors that contribute to poor Mathematics learning outcomes.

According to the study of Hunt *et al.*(2021), the barriers to Mathematics education are not isolated but rather interwoven, socioeconomic status, cultural beliefs and educational infrastructure (social factors) interact with students' cognitive abilities and learning styles as well as their emotional responses and attitudes towards Mathematics (affective factor). A valuable framework for understanding the complex challenges facing Mathematics Education in Developing Nation.

In line with this, societal barrier, got the highest mean of 3.21 (SD = 0.78), interpreted as High. This means that lack of resources including access to quality educational materials and technology, method of instruction and attitude of teachers can directly affect students' performance in Mathematics. Conversely, society plays a significant role in creating barriers to Mathematics performance, often shaping negative perception, expectation and opportunities that hinder individual engagement and success in the subject. For instance, lack of access to engaging learning materials, technology, ineffective teaching methods that do not cater to the diverse needs of individuals, and teachers' attitudes can contribute and lead to a gap in learners' understanding that become difficult to overcome as they progress to higher levels of Mathematics.

Chand *et al.* (2021) perceive the causes of poor performance in Mathematics as quality performance and qualification of teachers that significantly influence students. Another reason is that teachers employ the wrong teaching methods of learning, which results in students' general hatred for the subject. It further concluded that if Mathematics is to be appreciated by the students, teachers must use new pedagogies that can stimulate students to gain interest in Mathematics classes. In the current era of education, students are encouraged to discover and build knowledge considering their interests. Teachers should incorporate methods that involve active

participation. It is stressed that teachers' attitudes in Mathematics are the significant determinant to negative attitudes among students. The way students perceive teachers' characteristic will affect their attitude toward Mathematics. Furthermore, it is important to provide students with the necessary tools and resources to help them understand and apply mathematical concepts. This includes textbooks, calculators, and other visual aids. By providing these resources, students can better understand and apply their reasoning skills (Mamun *et al.*, 2020).

On the other hand, the affective barrier, got the lowest mean of 3.04 (SD = 0.61), interpreted as High. This means that, on average, participants perceived this barrier as relatively high in Mathematics performance. However, among the three barriers, students are more likely to blame cognitive limitations and societal expectations for Mathematics performance rather than effective barriers. Also, it might have a greater degree of individual variation and attributional biases than cognitive and societal barriers. The student might attribute their success or failure to cognitive and societal barriers than effective barrier.

Furthermore, the attitude of students participating in this study could influence the findings. For instance, students with high levels of motivation and interest in the subject might develop strategies and might have strong study skills naturally, while others might struggle more to overcome. These impact effective barriers as less likely to perceive barrier on Mathematics performance. The study of Tamayo (2021), given that attitude and performance are closely associated, revealed that a positive attitude and disposition toward Mathematics and further stated better Mathematics Performance would result to higher grades. It is also clear that motivation builds students' interest in learning Mathematics. Among other things, Zang and Wang (2020) found that Mathematics interest had a direct and positive effect on students' performance.

**Problem 2. What is the Academic Performance of Grade 5 Learners in Mathematics for the First Quarter of the School Year 2024-2025?**

**Table 6:** Distribution on Respondents' Level of Academic Performance of Grade 5 Learners in Mathematics for the First Quarter

Level of Academic Performance	1st Quarter	
	Frequency	Percentage
Outstanding (90 – 100)	31	15.5
Very Satisfactory (85 – 89)	51	25.5
Satisfactory (80 – 84)	89	44.5
Fairly Satisfactory (75 – 79)	29	14.5
<b>Total</b>	<b>200</b>	<b>100.00</b>

Legend:

(90-100%)=Outstanding,

85-89%)=Very Satisfactory,

(80-84%)= Satisfactory,

(75-79%)= Fairly Satisfactory,

(74% below)= Did Not Meet Expectations

Table 6 illustrates the distribution of Grade 5 learners' academic performance in the Mathematics area for the 1st Quarter of the School Year 2024-2025. The data revealed that the highest frequency in 1st Quarter, 89 (44.50%), belonged to the 80-84 category described as Satisfactory. This means that a high portion of Grade 5 learners achieved scores within the 80-84 range in Mathematics for the 1st Quarter of the School Year 2024-2025. It suggests that many learners are performing at a level considered satisfactory, which is a positive indicator of their understanding of the subject matter at this stage. The instructional strategies and resources implemented during this quarter may have effectively supported student learning. The concentration of scores in the 80-84 range could imply that teachers are providing adequate support, clear explanations, and engaging learning activities that resonate well with the learners, leading to higher performance levels.

However, there may also be a need to explore ways to challenge students further, especially those on the higher end of the scale. The predominance of learners in the 80-84 range might prompt educators to examine their teaching methods, curriculum implementation, and assessment practices to determine what factors are contributing to this achievement level. It may also be essential to analyze the potential reasons for lower performance among the remaining students, considering factors such as teaching methods, classroom environment, or resource availability. Further, the high frequency of students in the 80-84 range may lead to a sense of confidence and motivation among learners, reinforcing positive attitudes toward Mathematics. Given that attitude and performance are closely associated, positive attitude and disposition toward Mathematics and further stated the better their Mathematics Performance, the higher their grade. Significantly, this implies that they value the importance of Mathematics not only in their academic endeavor but also in the different facets of life (Tamayo ,2021). This perception can foster a conducive learning environment where students feel supported and encouraged to excel. Similarly, the lowest percentage of learners falls within

the 75-79 category with a frequency of 29 (14.50%) in the 1st Quarter, which is described as Fairly Satisfactory. This means that the instructional strategies or curriculum delivery may not be fully meeting the needs of these learners. Given that the 75-79 category represents a lower achievement level, educators might consider reviewing their teaching methodologies, pacing, and the resources utilized to identify potential gaps that could be addressed to help improve these students' understanding and performance. It indicates that there is a distinct group of learners who may require additional interventions or support mechanisms to help them progress in Mathematics. The fact that 14.50% of students are scoring in this lower range emphasizes the importance of early identification of struggling learners and the necessity of implementing effective instructional strategies to boost their confidence and competence in the subject.

As observed, this distribution of learners' academic performance reflects a need for differentiated instruction. Educators might observe that the teaching methods currently employed may not be conducive to all students, particularly those falling in the lower scoring range. This observation could prompt further analysis of classroom practices, including the need for more personalized learning experiences. Wang *et al.* (2020) found out that the distribution of academic performance in Mathematics among learners is significantly influenced by various factors, including socioeconomic status, teaching methods, and individual learning styles. Their research highlights that learners from higher socio-economic backgrounds tend to perform better in Mathematics due to access to resources and support systems that enhance learning. In contrast, students from disadvantaged backgrounds often face barriers such as limited access to educational materials and less parental involvement, which can lead to lower performance levels.

**Problem 3. Is There a Significant Relationship between The Barriers and the Learners' Academic Performance in Mathematics for the First Quarter of the School Year 2024-2025?**

**Table 7:** Test on Relationship Between the Barriers and the Learners' Academic Performance in Mathematics for the First Quarter

Barriers on Mathematical Performance	Learners' Academic Performance in Mathematics		
	r-value	p-value	Interpretation
Cognitive	0.11	0.04	S
Affective	0.04	0.03	S
Societal	0.22	0.03	S
<b>Overall</b>	<b>0.12</b>	<b>0.03</b>	<b>S</b>

Legend: \*significant at  $p < 0.05$  alpha level; S- Significant; NS- Not Significant

Table 7 presents the correlation analysis between the perceived barriers and the learners' academic performance in Mathematics for the first quarter of the School Year 2024-2025 with an overall r- value of 0.12 and p-value of 0.03. It means that there is a significant relationship

between cognitive, affective and societal barriers to academic performance. This implies that the null hypothesis is rejected. It reveals a significant relationship on the overall result of the three factors that indicates a direct relationship between the mathematical barriers and

the academic performance, thus when barriers increase, performance decrease.

The findings further revealed that even though the difference is closely related between the variables, it shows that among the three barriers, societal barriers demonstrate the highest correlation ( $r=0.22$ ,  $p < 0.03$ ) interpreted as significant related to academic performance. This means a more substantial positive correlation. Hence, as societal barrier increases academic performance tends to decrease. These external influences, like limited resources, have a more noticeable effect on societal barriers. This manifests in several ways, such as inadequate access to qualified teachers, lack of learning material or resources such as textbooks and digital learning material which limits opportunities for practice exploration leads to fewer enrichment activities and support services. These resource disparities create a significant gap on mathematical understanding and hindering the potential of many students to succeed in Mathematics. It suggests that this societal influences in which students operate plays a key role in shaping their academic success. It indicates that societal factors can either enhance or hinder their learning. As perceived, addressing societal influences or harnessing positive societal factors could lead to a significant improvement in the learners' performance in Mathematics.

Amato *et al.* (2022) posited that societal factors significantly impact students' performance in Mathematics. Their study emphasizes that students often face barriers arising from their socio-economic backgrounds, including limited access to educational resources, inadequate support from families, and societal attitudes towards Mathematics. These factors can lead to negative perceptions of Mathematics as a subject, thereby affecting learners' motivation and engagement.

While societal barriers significantly impact access to resources and opportunities for learning. Cognitive barriers also play a significant role related to Mathematics performance. The findings reveal a statistically significant, weak positive correlation ( $r= 0.11$ ,  $p<0.04$ ) between cognitive factors and Mathematics performance. While  $p$ - value indicates the correlation is unlikely to be due to chance, the small magnitude of the  $r$ -value suggests that the cognitive factors alone account for only a very small amount of the variance in Mathematics performance. This observation suggests that while cognitive abilities like memory retention are important, they are not the sole determinants of performance in Mathematics.

Furthermore, research by Comighud *et al.* (2020) examines the factors contributing to memory retention and its effect on students' academic performance in Mathematics. They found out that while memory retention is important, other factors like motivational practices, goal setting, and personalized learning also significantly impact students' mathematical achievement.

Conversely, the correlation analysis revealed a weak positive correlation between affective barrier and academic performance ( $r=0.11$ ,  $p<0.03$ ) while statistically

significant but with a negligible effect size. This means that affective barriers, such as emotions and attitudes, also show a significant relationship with academic performance, although this relationship is weaker compared to cognitive and societal factors. It suggests that emotional elements, like attitude, motivation and interest, still contribute to students' performance. It indicates that even minor affective barrier can have an impact on how well students perform. This often manifested as attitude towards Mathematics, lack of motivation and interest, a feeling tension and apprehension related to mathematical task, leading to avoidance, delay and ultimately lower performance. Students who doubt ones' mathematical capabilities lead to frustration and reinforcement of their negative self-perception. This creates a significant obstacle to learning and academic success in Mathematics. As observed, emotional factors have a notable effect, though not as strong as societal influences. As perceived, helping students manage their emotions and attitudes toward Mathematics could improve their outcomes.

Consequently, the students with a positive attitude strengthen their study habits or learning activities that in turn help to improve their academic performance. Thus, the students with high study attitudes or positive attitudes towards the subject tend to achieve more in comparison to the students having lower study attitudes (Guinocor *et al.*, 2020). Thus, the students with positive attitude help to motivate them to achieve better performance in Mathematics.

## CONCLUSION

This study investigated perceived barriers to Grade 5 Mathematics performance in Cagayan de Oro City's West I and West II districts during the School Year 2024-2025. The analysis revealed societal barriers as the most significant obstacle to Mathematics performance. Limited resources in public schools—inadequate funding, outdated facilities, lack of materials and technology—created unequal educational opportunities, impacting student performance and perpetuating a cycle of poverty. This resource scarcity also negatively affected cognitive skills, particularly memory retention, although less severely than societal factors. Affective barriers (attitude, motivation, interest) were identified as the least significant, varying greatly among individuals. While the majority of students performed well, closer examination of the 75-79 grade range reveals a need for targeted support to help these students reach their full potential. This requires understanding individual learning styles, strengths, weaknesses, resource access, and socio-emotional factors. The study concludes that perceived barriers are complex and interconnected. A comprehensive approach is needed to improve Mathematics education, including targeted interventions to address resource limitations, enhance memory retention through practice and application, and support students' individual needs. This multifaceted strategy promises to significantly improve both academic performance and overall learning experiences in mathematics.

## Recommendations

Based on the given conclusions of the study, several recommendations are presented:

1. Institutions and schools should prioritize addressing resource deficiencies such as outdated facilities, insufficient materials, and limited technology and ensuring equitable resource allocation across all schools. Strengthening community partnerships to supplement school resources is also vital. Pedagogically, teaching strategies should emphasize memory retention techniques like spaced repetition and active recall. Early intervention programs are needed to address cognitive challenges proactively. Individualized learning plans, tailored to students' unique learning styles and needs, are essential, along with teacher training focused on fostering positive attitudes and motivation.

2. Teachers should prioritize the development of personalized learning based on individual needs. Incorporate active learning strategies and diverse learning resources and provide support services to enhance academic performance among learners achieving grades between 75-79 category. Continuous monitoring and evaluation of these interventions to ensure their effectiveness.

3. Teachers should devise a comprehensive plan that caters to the complex barriers impacting student performance and encourages collaboration among parents and the community to establish enabling conditions that support both academic and emotional development.

## REFERENCES

- Amato, P. R., Tien, D., & Miranda, L. (2022). The impact of socio-economic status on mathematics performance: An analysis of barriers faced by learners. *International Journal of Educational Research*, 117, 102-110. <https://doi.org/10.1016/j.ijer.2022.101150>
- Ariyanti, C., & Santoso, J. (2020). Addressing Students Learning Gaps in Mathematics through Differentiated Instruction March 2023. *International Journal of Educational Management and Development Studies*, 4(1), 69-87. <https://doi.org/10.53378/352967>
- Batanero, C., Godino, J. D., & Ruiz, M. (2020). Attitudes toward mathematics: An overview of research and its implications for teaching. *Educational Studies in Mathematics*, 103(3), 257-273. <https://doi.org/10.1007/s10649-020-09921-0>
- Bicer, A., Lee, H. S., & Karp, K. S. (2019). Examining the relationships between student engagement, resources, and performance in mathematics education. *International Journal of Mathematical Education in Science and Technology*, 50(6), 835-850. <https://doi.org/10.1080/0020739X.2019.1595637>
- Brezavšček, S., Jerman, J., & Podlesek, A. (2020). Factors influencing mathematics achievement of university students of social sciences. *Mathematics, Education, Psychology*, 8(12), 2134. <https://doi.org/10.3390/math8122134>
- Bringula, R., Reguyal, J., Tan, D., & Saida, U. (2021). Mathematics self-concept and challenges of learners in an online learning environment during the COVID-19 pandemic. *Smart Learning Environments*, 8, 22. <https://doi.org/10.1186/s40561-021-00168-1>
- Cavanagh, M., Hurst, J., & Cooper, K. (2021). Motivation and engagement in mathematics: A systematic review of the literature. *Educational Psychology Review*, 33(2), 391-416. <https://doi.org/10.1007/s10648-020-09533-4>
- Chan, S., Chaudhary, K., & Prasad, A. (2021). Perceived causes of students' poor performance in mathematics: A case study at Ba and Tavua secondary schools. *Frontiers in Applied Mathematics and Statistics*, 7, Article 614408. <https://doi.org/10.3389/fams.2021.614408>
- Dembélé, M., & Miannay, D. P. (2019). Improving the quality of teaching and learning in mathematics: A case study of teaching methods and learning styles. *Educational Studies in Mathematics*, 100(2), 119-135. <https://doi.org/10.1007/s10649-019-09902-1>
- Dewi, N., Chetty, S., Handayani, L., Sahabudin, N. A., Ali, Z., Hamzah, N., Shamsiah, N., Rahman, A., & Kasim, S. (2019). Learning styles and teaching styles determine students' academic performances. *International Journal of Evaluation and Research in Education*, 8(4), 610-615. <https://doi.org/10.11591/ijere.v8i3>
- Gathercole, S. E., Pickering, S. J., & Gath, K. (2020). Attention and working memory in mathematics achievement. *Journal of Experimental Child Psychology*, 191, 104705. <https://doi.org/10.1016/j.jecp.2019.104705>
- Geary, D. C. (2020). Cognitive and motivational characteristics of children who struggle with mathematics. *Journal of Educational Psychology*, 112(1), 131-145. <https://doi.org/10.1037/edu0000360>
- Goetz, T., Bieg, M., Lüdtke, O., & Pekrun, R. (2020). The role of students' emotions in mathematics performance: A meta-analysis. *Educational Psychology Review*, 32(1), 37-65. <https://doi.org/10.1007/s10648-019-09474-8>
- Guinocor, M., Garcia, R. S., & Galing, P. J. (2020). Mathematics performance of students in Philippine State University. *International Electronic Journal of Mathematics Education*, 15(3), em0586. <https://doi.org/10.29333/iejme/7859>
- Gundaya, M. J. (2023). Factors affecting learners' performance in general mathematics at Phinma-COC. *International Journal of Research and Scientific Innovation Society*. <https://doi.org/10.47772/IJRIS/2023.70520>
- Hariyanto, J. (2021). Benefits of student attention in the implementation of learning. *Turkish Journal of Computer and Mathematics Education*, 12(3), 1642. <https://doi.org/10.17762/turcomat.v12i3.1642>
- Hunt, T., Simms, V., Cahoon, A., & Muwonge, C. M. (2021). Socio-cognitive-affective barriers to mathematics education in developing nations. In *Quality education* (pp. 1-11). [https://doi.org/10.1007/978-3-319-69902-8\\_128-1](https://doi.org/10.1007/978-3-319-69902-8_128-1)
- Karunanayake, D., Wijesinghe, H., & Perera, M. (2020).

- How teaching styles affect the enhancement of students' mathematical education. *International Journal of Scientific Research in Science and Technology*, 7(6), 1–8. <https://doi.org/10.32628/IJSRST207616>
- Li, J., Xue, E., Li, C., & He, Y. (2023). Investigating latent interactions between students' affective cognition and learning performance: Meta-analysis of affective and cognitive factors. *Behavioral Sciences*, 13(7), 555. <https://doi.org/10.3390/bs13070555>
- Mata, M. L., Monteiro, V., & Peixoto, F. (2019). Attitudes towards mathematics: Effects of individual, motivational, and social support factors. *European Journal of Psychology of Education*, 34(1), 11–26. <https://doi.org/10.1007/s10212-017-0360-8>
- Mokhtar, M. A. M., Ayub, A. F. M., Said, R. R., & Mustakim, S. S. (2019). Analysis of year four pupils' difficulties in solving mathematical problems involving fractions. *International Journal of Academic Research in Business and Social Sciences*, 9(11), 1560–1569. <http://dx.doi.org/10.6007/IJARBS/v9-i11/6766>
- Noyes, A., & Adya, M. (2020). Memory retention and its impact on mathematical problem-solving. *Mathematics Education Research Journal*, 32(2), 195-214. <https://doi.org/10.1007/s13394-020-00314-7>
- Panulaya, A. S. H. (2024). Factors influencing learners' academic performance in Kinoguitan, Division of Misamis Oriental at Phinma COC. *International Journal of Research Publications*, 10, 1441320246183. <https://doi.org/10.47119/IJRRP1001441320246183>
- Passolunghi, M. C., Riva, V., & Cipolla, A. (2020). Working memory and mathematical achievement: The role of memory retention in solving complex problems. *Journal of Numerical Cognition*, 6(3), 230–248. <https://doi.org/10.5964/jnc.v6i3.222>
- Pillado, I. A., Comighud, S. M., & Futralan, M. C. (2020). Factors on memory retention: Effect on students' academic performance. *International Journal for Research in Mathematics and Statistics*. <https://doi.org/10.5281/zenodo.3780621>
- Pllana, D. (2020). Keeping students' attention active. *Education Society and Human Studies*, 1(2), 171. <https://doi.org/10.22158/eshs.v1n2p171>
- Sakilah, N., Santos, D. L., & Reyes, M. T. (2018). Difficulties and coping strategies in understanding mathematical concepts in a private higher education institution in Tagum City, Davao del Norte, Philippines. *Davao Research Journal*, 14(1). <https://doi.org/10.59120/drj.v14i1.10>