
Unheard Stories from Grade 1 Teachers: Unearthing the Learning Experiences in the Mathematics Subject of Non-Numerate Grade 1 Pupils

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Abstract — This study examined the learning experiences of non-numerate Grade 1 pupils in Bacolor North District, Pampanga, for the School Year 2024–2025. Using a qualitative phenomenological design, it aimed to describe the pupils’ challenges in learning mathematics, their engagement patterns, teachers’ modified strategies, and existing support programs to enhance numeracy skills. Data were gathered through semi-structured interviews with Grade 1 teachers and were analyzed thematically using Braun and Clarke’s (2006) framework.

Findings revealed that pupils struggled with math cognition, conceptual understanding, and engagement, often exhibiting low confidence, shyness, and a reliance on teacher guidance. Teachers address these through concrete, visual, and interactive materials, personalized instruction, and motivational support. Existing programs offer targeted interventions, varied learning modalities, and collaborative monitoring. To improve learning, a structured multisensory numeracy program, differentiated remediation strategies, and strengthened support systems are recommended. The study concluded that improving numeracy among non-numerate pupils requires targeted, multisensory, and collaborative approaches involving teachers, parents, and school support systems.

Keywords: Unheard Stories, Grade 1, Phenomenology, Lived Experiences

I. INTRODUCTION

A significant challenge in teaching mathematics involves working with learners who have a low level of numeracy skills. According to Pangan (2016), numeracy is the combination of mathematical knowledge, problem-solving skills, and communication skills that all people need to function successfully in our technological world. It performs as the fundamental building block for mathematical skills. Thus, enriching learners to gain a deeper understanding of mathematics and enabling them to tackle complex problems and tasks, teachers are tasked not only with refining learners' skills in acquiring knowledge but also with developing their numeracy skills.

Ofsted (2018) has emphasized the significance of beginning mathematical education at a young age for a number of reasons, including the influence of previous accomplishments on the likelihood of future academic performance, and the necessity of concentrating on numeracy.

Despite this, many pupils were already falling behind in their math classes even before the epidemic began. According to observations made by Belleza (2022), students progressing through higher grades in primary school struggled with mathematics because they had not yet mastered their numeracy skills. Additionally, statistics indicate that 10% of the total population at Jibolo Elementary School in the 2019–2020 school year did not master the four fundamental operations. One of the reasons learners are retained in grade level is their low numeracy skill level, indicating that they did not fully learn (Belleza, 2022).

In Malaysia, findings from the Primary School Assessment Test (UPSR) indicate that elementary school students in their country have difficulty answering questions that require numeracy understanding. In particular, these students have trouble with questions that involve fundamental and problem-solving calculations. This is supported by the findings of the Trends in International Mathematics and Science Study (TIMSS) in 2010, which demonstrated that Malaysian students are less familiar with questions requiring understanding, such as those that require the application of real-world knowledge, such as money titles, lengths, and weights. TIMSS demonstrated that Malaysian students were less familiar with questions requiring understanding in 2010 (Latiban & Mendez, 2022).

On the other hand, the Philippines ranked second from the bottom in the recent Programme for International Student Assessment (PISA) in 2018. The mean score in mathematics literacy was 353 points, with only 1 out of 5 learners gaining at least the level 2, which is the minimum proficiency level. Meanwhile, in 2016, only 57% of Grade 6 learners performed mastery of mathematics in the Grade Six Achievement Test, with only 44% of those assessed learners passing the CSEC Mathematics. This aligns with the findings of Care et al. (2015), who noted that Filipino learners consistently underperform in national and international surveys on mathematics and science competencies compared to neighboring countries.

In view of these realities, emphasizing the needs of learners who are not numerate should be done without hesitation. As a result, non-numerate learners will be sought for this study. By focusing on students who are not numerate, this study aims to enhance mathematical competence in the Philippines, particularly among students who struggle to comprehend and apply numerical concepts.

In order to discover a solution to this issue, the researcher is interested in getting knowledge of the mathematical learning experiences of learners who are non-numeric. The learning experience of students is critical to the success of higher education provision. It lays the foundation for developing students' knowledge and understanding of the subject, as well as building up their confidence and employability skills. Learning experiences are important for a number of reasons, including scaffolding, curriculum, and instructional methods. To transform classrooms into learning communities of active and collaborative mathematical inquiry, teachers need to have access to and be able to use instructional materials for thought-provoking activities and projects, software for simulation and modeling, and resources in the community for authentic learning experiences (Casinillo et al., 2020).

The process of gaining information, abilities, and attitudes connected to mathematics via teaching, investigation, and practice is referred to as "learning experiences" in mathematics. Such learning experiences are essential to helping students build a strong foundation of knowledge and understanding of mathematics; while simultaneously developing the confidence and employability skills they will need in their future.

In addition, students who have had positive learning experiences in mathematics are more likely to actively engage with the lesson and have a higher level of involvement with the various activities that take place in the learning environment, as stated by Code et al. (2016). These findings were found in a study that was conducted.

Hence, teachers are encouraged to cultivate a learning atmosphere where students actively participate and collaborate with one another. However, achieving this goal requires equipping learners with appropriate information and guidance with the learning experiences that learners already have. When they have a greater awareness of their students' needs, they are better able to design classroom environments that are conducive to individual differences in learning styles and that encourage the participation of all students. This is something that is becoming increasingly important in the modern era, as our classrooms have become much more diverse and have begun to include students from a wide variety of backgrounds and cultures.

Alabekee et al. (2015) and House (2006) both recommend that mathematics should be taught using strategies that are effective in getting students to interact with their teachers. This is due to the fact that perceptions and ideas about mathematics stem from previous experiences, both cognitive and affective, that a person has had throughout their life. In addition, Huijsmans, Kleemans, and van der Ven (2020) investigated how students with mathematical learning problems (MLD) and typical difficulties (TD) vary in terms of their cognitive abilities by studying the learning profiles of students with MLD and TD. They discovered that children with MLD made up just a tiny portion of a larger group of children with TD, and that there was no significant difference between the two groups' cognitive abilities in terms of their ability to solve mathematical problems.

In light of these factors, the study did not limit itself to examining the cognitive component through the lens of the challenges that non-numerate pupils encounter when trying to grasp mathematical concepts. Therefore, the study recognized the importance of looking into and understanding the holistic learning experience of the learners. It also aimed to address the non-cognitive factors that affect the difficulty learners experience in learning math.

Every student's experience of learning math is unique and depends on their individual circumstances. Factors such as social, cultural, historical, pedagogical, psychological, and

cognitive backgrounds may affect these experiences. Hence, the study employed the same theoretical framework as Belbase et al. (2021) to understand how non-numerate learners learn mathematics. This framework took into consideration the various factors that might be impacting the learning process, and researchers used it to gain insights into how different variables are related to a student's success or lack thereof.

In terms of social, cultural, historical, educational, and psychological aspects, there has not been a lot of study done to understand the learning experiences of pupils who are non-numeric. Thus, the study aimed to contribute to the body of knowledge on what is already known about how learners who have low levels of numeracy skills learn mathematics. The study brought a better light of understanding on how non-numerate learners and also the appropriate methods or teaching strategies that could be used in classroom to improve their mathematics skills.

So, the goal of this study was to add new information to what is already known about how people who aren't good with numeracy learn math. The study gave the researcher a better idea of how students who are non-numerates learn math, as well as any methods that could be used in the classroom to help these students improve their math skills. To be more specific, it covered the non-numerate students of grade 1 who are located in Bacolor North District, Division of Pampanga.

Theoretical Framework

A body of research suggests that cognitive issues may play a role in math learning difficulties (Fuchs et al., 2019). However, it is important to note that there can be many factors that contribute to difficulty in learning mathematics, and that cognitive issues are just one possible piece of the puzzle. Some students' learning difficulties can be linked to social, cultural, historical, and pedagogical aspects of mathematics (Belbase et al., 2021). By closely examining how students with non-numerate backgrounds learn mathematics, we can gain a better understanding of what specifically causes the difficulties and how we can design more effective learning approaches for them.

Therefore, the study was guided by the theoretical framework constructed by Belbase et al. (2021) to understand the learning experience in mathematics of non-numerate learners. The framework focused on the important factors that influence the learning process, such as students' backgrounds and experiences, their socio-cultural environment, their cognitive skills and strategies for learning mathematics, and the pedagogical strategies used by teachers.

The social aspect focuses on the social dynamics that may influence students' mathematics learning activities inside and outside of school. Cultural aspects are related to how parents and other community members view mathematics in general and school mathematics. Professional connections to academic mathematics in a cultural context can motivate students to learn and make sense of mathematics.

On the other hand, historical aspects can support students' understanding of mathematics in different contexts. The ancestors or legends of problem-solving in mathematics can help students and teachers understand why specific rules and mathematical approaches are more important than others.

The pedagogical and psychological aspects are relevant with the teaching and learning process in mathematics. These bring a meaningful way for learners to get motivated and increase their self-esteem. Hence, learners can understand math deeply and become inspired to take on complex problem and tasks as they connect math with these different aspects.

The figure below illustrated the theoretical framework of the study.

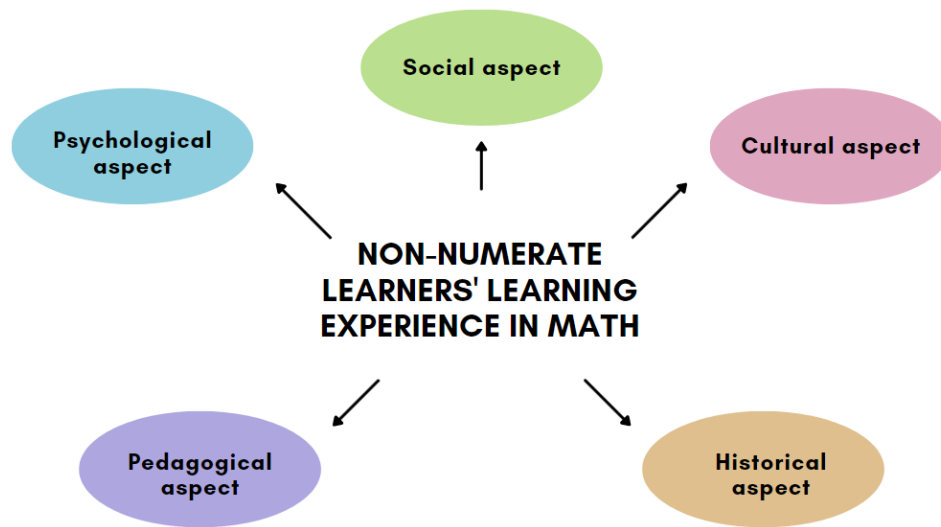


FIGURE 1
CONCEPTUAL FRAMEWORK OF THE STUDY

Statement of the Problem

This study explored the learning experiences in mathematics of selected non-numerate grade 1 pupils in Bacolor North District, Division of Pampanga, for the School Year 2024 – 2025.

Specifically, it answered the following questions:

1. How do the participants describe the specific challenges faced by non-numerate grade 1 pupils in Bacolor North District in understanding basic mathematical concepts?
2. What are the observed behavioral and engagement patterns of non-numerate grade 1 pupils during mathematics classes?
3. How do the participants modify their teaching strategies to accommodate the learning needs of non-numerate grade 1 pupils during mathematics instruction?

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4. What types of support programs are available to assist non-numerate grade 1 pupils in Bacolor North District, and how effective are these programs in improving their numeracy skills?
 5. Based on the study's findings, what targeted intervention/s can be made to enhance the teaching and learning of mathematics for non-numerate grade 1 pupils?

Significance of the Study

The researcher hoped that this endeavor had shed light on the contemporary world of academia. Hence, the beneficiaries of the result of this research were the following:

Curriculum Implementation Division Chief. The results of the study is aimed to guide the policy, program, and project development for the Basic Education Learning Continuity Operation Plan, specifically in providing data-driven recommendations to enable them to make informed decisions on learning continuity efforts in mathematics and provide technical assistance to school heads.

Teachers. An in-depth understanding and comprehensive analysis of the learning experience in mathematics was set to help teachers identify areas where students are struggling and need extra support. This can serve as a foundation for developing more targeted and individualized interventions in order to support them. It can also provide support to teachers in designing more effective teaching strategies that address the diverse needs of struggling learners.

Learners and Parents. An in-depth understanding of the mathematics learning experience enriches and empowers the self-confidence of learners to achieve more motivation in succeeding. Learners and parents should be involved in these experiences, thereby creating an active role in the progress of the learners.

Future Researchers. This study contributed to the body of knowledge and literature, specifically with the learning experiences in mathematics of non-numerate learners in mathematics. This study may serve as a starting point to further investigate and collect profound insights and information leading to exploring a more extensive study on the subject. By providing a detailed look into the mathematics learning experience particularly of non-numerate learners, future researchers can gain remarkable insights on how this type of learners perceive and interact with the subject.

Scope and Delimitation of the Study

This study aimed to explore the learning experiences in mathematics of selected non-numerate among Grade 1 pupils in Bacolor North District, Division of Pampanga for the School Year 2024-2025. The study's participants were the select grade 1 teachers who will be purposively selected within the district.

Specifically, it aimed to answer the following questions: the participants' descriptions of the specific challenges faced by non-numerate Grade 1 pupils in Bacolor North District in understanding basic mathematical concepts, the observed behavioral and engagement patterns of non-numerate Grade 1 pupils during mathematics classes, the participants descriptions of their modified teaching strategies to accommodate the learning needs of non-numerate Grade 1 pupils during mathematics instruction and the types of support programs are available to assist non-numerate Grade 1 pupils in Bacolor North District, and how effective are these programs in improving their numeracy skills. Lastly, the targeted intervention can be made to enhance the teaching and learning of mathematics for non-numerate Grade 1 pupils.

Definitions of Terms

The following terms were defined conceptually and operationally to understand the crucial concepts better.

Learning Experience in Mathematics. The process of acquiring information, skills, and attitudes related to mathematics through teaching, investigation, and practice is referred to as “learning experiences” in mathematics (Chamberlin, 2009). In this study, this referred to specific challenges faced by non-numerate Grade 1 pupils, the observed behavioral and engagement patterns of non-numerate and their modified teaching strategies to accommodate the learning needs of non-numerate Grade 1 pupils.

Non-numerate Learner. This referred to learners identified as non-numerate in the Project All Numerate (AN) of the Department of Education (DepEd) which aims to make every Filipino a numerate.

II. METHODOLOGY

This chapter presents the research design, study participants, instruments, data collection procedure, ethical considerations, and data analysis.

Research Design

To complete this study, a qualitative research approach was utilized. Qualitative research methods yield insights that are inherently subjective and reflect the researcher’s perspective. The results are not statistically valid or reproducible, but they can give significant insights into the human-centered design process (Silverman, 2020).

To be more specific, the phenomenological research design was served as the primary source of direction for the completion of the study. Phenomenology can be viewed as both a philosophy and a method of investigation; it is more than just a straightforward approach. To understand the conscious experience of human existence, it is essential to consider the role that the mind plays in interpretation and the creation of meaning (Qutoshi, 2018). When employing a phenomenological qualitative approach, the theoretical framework used influences the nature of the research, its methodology, and its analysis (Taylor et al., 2016).

Therefore, a qualitative research method, specifically a phenomenological approach, was employed in this study to characterize the learning experiences in mathematics of non-numerate learners in grade 1 and how they navigated their math classes (Creswell, 2013).

Participants of the Study

The participants was purposively selected to comprehend better the one-of-a-kind outlook they bring about the issue (Smith et al., 2022). Given the research objectives, the study participants were the grade 1 teachers. They were selected through purposive sampling.

In addition, purposive sampling was used to collect the in-depth viewpoint of non-numeric learners in grade 1. This sampling technique employed a non-probability sampling design to capture the rich lived experiences of grade 1 teachers in relation to the learning experiences of grade 1 non-numerates.

According to the theory presented by Robinson (2014), purposive sampling is the deliberate selection of informants based on their capacity to provide light on a particular topic, idea, or phenomenon of interest. In addition, the researcher chose the participants of this study based on the following criteria: a) Teachers currently teaching Grade 1 mathematics in Bacolor North District. b) Teachers with at least ten (10) years of teaching experience in Grade 1 mathematics. c) Teachers specializing in general education mathematics for Grade 1, d) Teachers who have participated in professional development or training specific to teaching mathematics within the past three years.

Research Instrument

According to Taylor et al. (2016), phenomenologists acquire insight through the use of participant observation, in-depth interviews, and other qualitative procedures that create descriptive data. In the same manner, the data for the study was collected through the use of a semi-structured interview. According to Doyle (2020), a semi-structured interview is a type of

conversation in which the interviewer does not exactly follow a prescribed set of questions. A more open-ended questions were asked in order to facilitate a discussion between the interviewer and the person being interviewed. Given this, obtained information aids in leading an in-depth analysis and interpretation of the data.

In addition, with the research procedure in mind, the research guide questions was evaluated with regard to (a) their applicability to the research topic, (b) their level of clarity, and (c) their grammatical construction. This guaranteed that the participants were asked the appropriate questions to gather the necessary data from their replies. Furthermore, education experts were provided these questions to examine and confirm the study questions before they are implemented. In addition, their opinions and ideas were considered to refine the interviewing process.

Data Collection

The researcher initially composed a letter to the Office of the Schools' Division Superintendent requesting permission to perform the study. After receiving formal clearance from the authorities, the consent letter was delivered to the respective school principals for distribution to the participants.

Before the interview, the selected participants was also supplied a copy of the questions. This enabled them to recollect crucial events involving their learning possibilities and the inventiveness revealed in the remote learning of a chosen group of grade 1 non-numerate students to record complete and relevant learning experiences.

The interview were done at the most convenient time for the participants. The researcher also evaluated the class schedule and appointment of each key informants to provide them flexibility in answering the interview questions. Lastly, in cases where in-person meetings were not possible, interviews were conducted via online platforms such as Messenger, Google Meet, or Zoom.

Ethical Considerations

The researcher performed the research endeavor in accordance with ethical norms. First, the researcher got the participants' written and informed consent to participate in the study. Second, to protect the confidentiality of the study participants, codes were used to characterize and identify the identities and replies of each participant who were interviewed. Any information gathered during the interview was treated with the highest discretion.

Data Analysis

The interviews' raw data was compiled and evaluated using a model for thematic data analysis. Thematic analysis is a technique for interpreting qualitative data from research. Typically, it is used for writings such as interview transcripts. Braun and Clarke (2006) provide a six-phase guide which is a very useful framework for conducting this kind of analysis. In this sense, the researcher meticulously studied the data to frequently uncover similar themes - subjects, concepts, and meaning patterns. After collecting data through interviews, the data were evaluated using the methods below: (a) attaching recordings to the transcript, (b) identifying significant points, (c) coding the key points, and (d) grouping comparable codes and assigning themes.

Figure 2 served as the researcher's guide to a methodical and exhaustive method of assessing and presenting the qualitative section's findings.

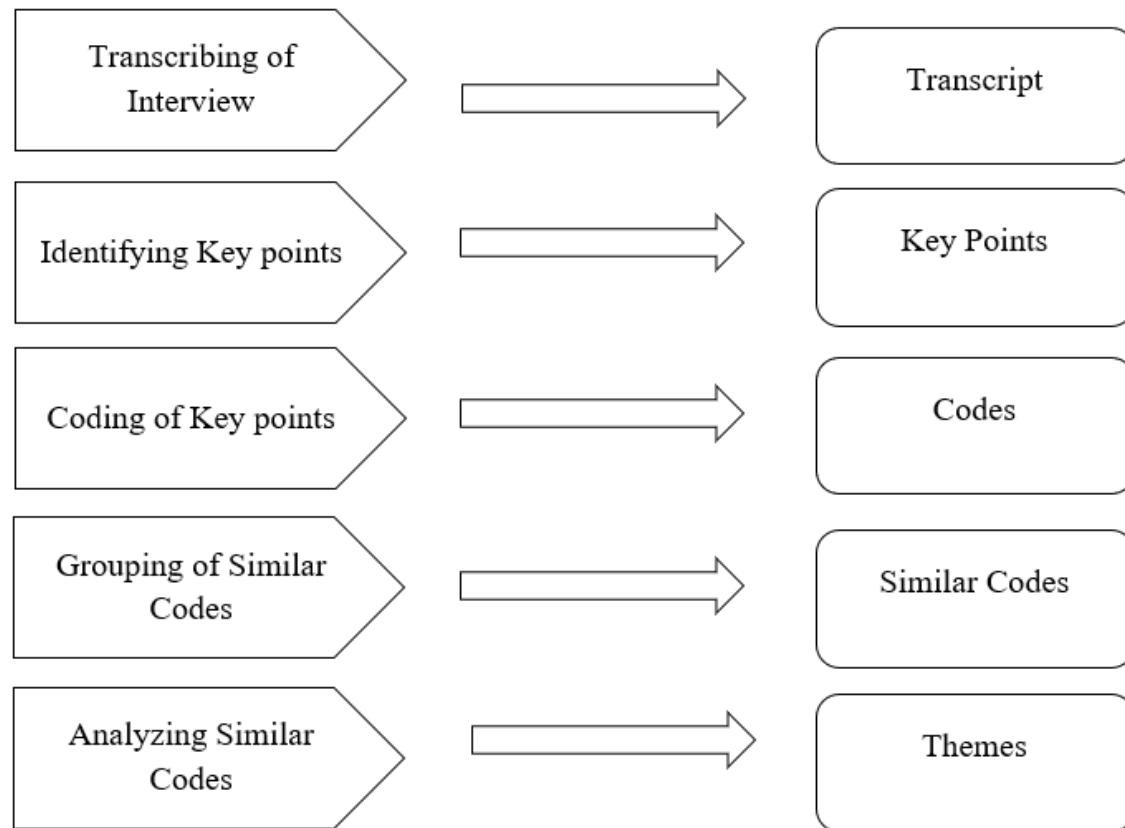


FIGURE 2
DATA ANALYSIS DIAGRAM

III. RESULTS AND DISCUSSION

This chapter highlights the results and discussion arranged according to the chronological order of the formulated research questions stated in Chapter 1.

1. Challenges Faced by Non-Numerate Grade 1 Pupils

Theme 1: Math Cognition Difficulties. This theme addresses the significant challenge of non-numerate grade 1 pupils in relation to mathematical cognition. This involves number recognition and recall. Several participants emphasized the struggle of learners in recognizing and naming numbers:

They have difficulty in recognizing numbers, they know how to count but they cannot recognize the numbers itself (P1a1).

Difficulty in recognizing and naming numbers can hinder their ability to engage with counting and basic operations (P4a1).

Many non-numerate pupils struggle to connect the written numerals with their corresponding quantities (P9a1).

They may not understand that the symbol "3" represents three objects (P9a2).

Hindi po nila matukoy ang itsura ng mga numero kaya hindi po sila makasagot nang tama pag may math activities (P10a1).

...This difficulty can make it challenging for them to count accurately and to visualize the quantities involved in addition and subtraction (P9a3).

...pupils may confuse similar-looking digits (like 6 and 9, or 3 and 8), hesitate to name numbers they have not memorized, or struggle to identify numbers out of sequence (P1c1).

Nahihirapan sa pagbibilang ng tamang sagot na nagiging dahilan ng pagkakaroon ng mababang marka sa tuwing magkakaroon ng pagsusulit (P5a1).

Some common challenges ... include: Difficulty remembering math facts, concepts, rules, formulas, sequences, and procedures (P2a1).

Limited Number Range Familiarity — inability to recognize single numbers, difficulty completing number line or sequence (P3c1).

These insights are similar to the study of Cornelissen et al. (2006) where visual recognition difficulties show that primary school students often reverse or confuse visual symbols in both recognition and writing tasks. This highlights the perceptual challenges in number identification.

Powell et al. (2012) emphasized how early numeracy skills such as quantity, discrimination and number recognition are crucial for developing the mathematical ability of children. Hence, difficulty in this area may result challenges in other numeracy competencies. Furthermore, Jordan

et al. (2009) highlighted that early difficulties in symbolic number recognition contribute significantly to long-term math learning problem which may particularly refer to understanding numerical magnitude and relationships.

Theme 2: Conceptual Understanding Gaps. Non-numerate Grade 1 pupils experience significant conceptual understanding gaps in which particularly involve distinguishing basic operations such as addition and subtraction. Several participants described that learners often experience confusion when identifying which operation to use due to limited vocabulary and symbol recognition.

They also found it difficult to distinguish between addition and subtraction especially if they struggle to recognize the words or the vocabularies used in these concepts (P1b3).

Differentiation between addition and subtraction (P8b1).

These findings emphasized that language and conceptual comprehension are closely relevant in mathematical learning. Pupils who fail to understand mathematical vocabulary or symbols may not develop a deep understanding of number relationships and operations. Jordan et al. (2009) noted that conceptual understanding in early mathematics which includes recognizing relationship between quantities is foundational for later arithmetic and problem solving skills.

Moreover, Geary (2011) described that learners with weak conceptual understanding often rely on rote memoration rather than true comprehension of numerical relationships. This limits their ability to apply concepts in varied contexts. This also relate with the observation that non-numerate pupils often depend heavily on teacher prompts when solving problems.

In conclusion, addressing gaps in this area requires explicit instruction that integrates mathematical vocabulary enrichment, hands-on visual materials, and contextual examples to bridge symbolic understanding and real-world application.

Theme 3: Learner Disengagement Challenges. Low engagement, short attention span, and lack of motivation during mathematics instruction is among the challenges of Grade 1 non-numerate pupils. This is described as learner disengagement as several participants noted:

They sometimes lack focus and attention that is why they have difficulty understanding the concepts (P1a2).

The most challenging for Grade 1 pupil when it comes to mathematical concepts is that they have short attention span, making it difficult to keep them engaged (P3a1).

They also lack confidence, because they think that Math is hard (P1a3).

...pupils may struggle to understand math-related directions, leading to confusion about what is expected in tasks or assessments (P2c1).

They are unmotivated to join in math activities (P7c1).

Dowker et al. (2016) emphasized that affective factors including anxiety, fear of failure, and low-self concept affects the mathematical performance and engagement of learners. Learners perceiving math difficult most likely withdraw from participating in their classes in which leads to more learning difficulties. Similarly, Cargnelutti et al. (2017) found that learners with low math self-efficacy tend to avoid math-related activities which further widens their achievement gap.

In addition to that, Skinner and Pitzer (2012) noted that disengagement occurs when learners experience repeated failure and reduced perceived control over learning tasks in which leads to diminished persistence and motivation. Therefore, it is important to hone a learning environment that is safe, engaging and success-oriented. Cultivating this type of learning environment facilitates a help where non-numerate learners reframe their perception about mathematics as achievable and interesting instead of difficult.

2. Observed Behavioral and Engagement Patterns on Non-Numerate Grade 1 Pupils

Theme 1: Negative Attitudes toward Math. This theme refers to the negative emotional and behavioral reactions of grade 1 non-numerate learners toward mathematics. Learners display their low interest and disengagement that can be attributed to their limited grasp of prerequisite concepts necessary for understanding new mathematical lessons.

Hindi sila interesado pag math na ang subject dahil po hindi po nila maintindihan ang pre requisites ng lesson (P9d1).

Due to difficulty engaging with the material, non-numerate pupils may become distracted and engage in behaviors unrelated to the task. This can be a sign of boredom or confusion when they don't understand the math content (P3d1).

They often cry when they do not know how to solve simple problems. They also show restlessness because they do not know what to do (P2f1).

In the field of education psychology, studies suggest that learners who experience repeated struggle in understanding mathematical concepts often lead to developing math anxiety and avoidance behaviors (Ashcraft & Krause, 2007; Ramirez et al., 2018). The emotional burden connected with failure and confusion reveals to reduce motivation and self-efficacy. This, in return, reinforces the negative disposition of learners toward math learning.

Thereofre, lack of interest, emotional distress and avoidance behaviors are often lead to the negative attitude towards mathematics among non-numerate learners. These are also rooted in cognitive struggle and lack of confidence. Addressing these challenges requires not only pedagogical scaffolding but also needs interventions that is affective and motivational. In this way, learners' confidence, engagement, and sense of achievement in math is rebuilt.

Theme 2: Low Confidence and Shyness in Math Engagement. This theme refers to the learners' low self-confidence and shyness during mathematics lessons with reflects both cognitive and emotional barriers to engagement.

They tend to not participate during the discussion. They show frustration because they have difficulties recognizing the numbers. They lack confidence so they tend to give up and not do trial and error approach. They are also distracted since they are Grade 1 pupils, they are very playful (P1d1).

Madalas hindi sila nagpaparticipate sa klase dahil nahiiya silang sumagot sa kadahilanang hindi pa sila marunong magbilang (P6d1).

Low confidence: Non-numerate pupils often lack confidence in their mathematical abilities. They may doubt their own skills and avoid situations where they might be perceived as struggling (P8d1).

Low self-esteem, not confident because they cannot submit or do their work task (P10d1).

Shy, timid and cannot understand the instructions, the lesson itself and don't know how to answer the activities (P6e1).

Nahihiyang sumali sa mga aktibidad at pagsasanay na nauugnay sa matematika (P7e1).

Pupils sometimes have lack of confidence in their math abilities expressing self-doubt and low self-esteem (P6f1).

Negative self-talk — they might engage in negative self-talk, saying things like “I can’t do this,” “I’m stupid,” or “I’ll never understand this” (P9f1).

Other pupils may show shyness or reserved behavior since they have no idea on what to do and how to solve in math. Some may feel confident because they know they have someone to lean on (P1g1).

These pupils often take a backseat in group activities, allowing more confident peers to take the lead. They may engage less with the math content and instead focus on observing others (P2g1).

Given these observations, non-numerate pupils’ lack of confidence often leads to withdrawal, avoidance, and dependence on peers or teachers for guidance. Research by Dowker (2005) and Miller and Bichsel (2004) similarly found that young children with low numeracy skills often develop math anxiety and low confidence. This results in reduced participation and persistence in solving problems.

In addition, Huang (2011) discussed that shy or reserved behavior among early learners often arises from a fear of failure or public embarrassment. For non-numerate Grade 1 pupils, shyness and low confidence are not merely personality traits but symptoms of academic struggle and unmet foundational learning needs.

Theme 3: Dependence on Manipulative and Teacher Guidance. Non-numerate Grade 1 pupils often exhibit a strong dependence on manipulatives and teacher guidance to perform mathematical tasks.

Pupils may engage in counting activities with visible hesitation or confusion. They often rely heavily on visual aids like fingers or manipulatives to help them count but can still make frequent mistakes (P1e1).

Reliance on concrete objects — these students often depend on manipulatives (P9e1).

Step-by-step guidance — non-numerate students often need constant step-by-step instruction from the teacher (P10e1).

These insights are consistent with the enactive-iconic-symbol model of Brunner (1996). This type of representation explains that young learners first understand mathematical concepts through manipulative-based experiences which is enactive before transitioning to visual which is iconic, and symbol understanding which is abstract. However, when learners fail to progress beyond the enactive stage, restriction in their growth in conceptual understanding is eminent. This is often the reason why non-numerate pupils continuously have difficulty in performing mathematical operations without concrete aids or clear teacher prompts.

It is shown by studies that even though manipulatives enhance conceptual understanding and engagement, their effectiveness still depends on how these are integrated into classroom instruction. Carbonneau, Marley, and Selig (2013) revealed that, through meta-analysis, manipulatives significantly increase the mathematical performance and achievement of learners but should be accompanied with clear guidance that helps learners relate physical actions to abstract representations.

Furthermore, Moyer-Packenham and Westenskow (2013) highlighted that manipulatives serve as bridging tools. However, if learners become overly dependent with these, they may have difficulty with abstract transfer and problem-solving independence. Additionally, if learners wait for teacher cues rather than attempting tasks autonomously in which scaffolding is not gradually reduced, learners may not be able to progress in learning (Wood, Bruner, & Ross, 1976).

3. Modified Teaching Strategies for Non-Numerate Grade 1 Pupils

Theme 1: Use of Concrete, Visual, and Interactive Learning Materials. This theme refers to the use of concrete, visual, and interactive learning materials in modifying teaching strategies for grade 1 non-numerate learners. Participants have the significance of using hands-on and visual materials to make abstract mathematical concepts more understandable for non-numerate learners. Participants shared the common use of integrated blocks, counters, and visual aids to encourage active participation and comprehension.

I use manipulatives and show more examples for them to understand the lesson (P1h1).

Incorporate hands-on learning tools such as counters, blocks, beads, number lines, and visual aids to make abstract concepts more concrete (P3h1).

...incorporate hands-on materials like blocks, counters, and number lines to help students visualize and physically engage with mathematical concepts (P4h1).

Use of manipulative and concrete objects (P6h1).

These practices are affirmed by the studies noting the effectiveness of manipulatives in developing mathematical understanding. Carbonneau, Marley, and Selig (2013) found that concrete manipulatives significantly enhance math performance, especially for struggling learners, by bridging abstract ideas with real-world experiences. Moyer-Packenham and Westenskow (2013) also revealed that manipulatives aids young learners to internalize numerical relationships which promotes conceptual retention and engagement.

Theme 2: Differentiated, Scaffolded, and Personalized Instruction. This theme is focused on the instruction of teachers that is differentiated, scaffolded, and personalized as they modify their teaching strategies to grade 1 non-numerate learners. Teachers described their efforts based on varying levels of numeracy skills of learners. Strategies mentioned included games, small-group sessions, simplified language, and contextualized examples. Some also highlighted Laboratory or experiential approaches.

Sometimes, we play games that will make them more engaged (P1h2).

Small group or one-on-one instruction (P6h2).

Relate math to real-life situation (P6h6).

Giving them activities, exercises suited to their level of understanding (P9h1).

I also use simplified language for better understanding for those who struggle in their vocabularies (P1h3).

Scaffolded learning (P6h3).

We need to consider their level of intelligence and provide different activities and we also need to teach them different strategies that can help them understand the instruction easily (P5h1).

Start with the basics, begin with the most fundamental concepts, such as number recognition, quantity, and one-to-one correspondence (P7h1).

Interactive activities are also a great help for them (P1i2).

Make use of a Laboratory approach to teaching mathematics where pupils learn by doing things in a classroom (P5i1).

They work on projects, play with materials and models, and use various tools, which helps them understand what this math terminology means (P5i2).

In a lab, a child can see how much of what they learn in maths comes to life (P5i3).

Differentiated instruction addresses learners' readiness, interest, and learning profiles (Tomlinson, 2014). This makes pedagogical instruction more equitable and effective. Studies also support that scaffolded and differentiated instruction benefits learners who struggle with numeracy. Power and Fuchs (2018) explained that tiered and individualized instruction improves foundational math understanding among early learners. This may be in the form of visual aids, guided practice, and gradual instruction. Furthermore, the use of play and real-life connections also reflects as an effective instruction for grade 1 non-numerate learners. This reflects the principles of experiential learning theory where learners construct meaning through active engagement (Kolb, 1984).

Theme 3: Reinforcement, Motivation, and Management of Learning Challenges. This theme refers to teachers emphasizing the consistent reinforcement, motivation, and behavior management in teaching non-numerate pupils. Motivational strategies such as praise, prizes, and game-based learning helped learners stay interested and reduce fear of failure. Others highlighted the conduct of daily drills, remedial sessions, and giving positive feedback and rewards to maintain engagement.

Daily practice will make them have a routine to recall and remember the lessons (P1h4).

Repetition and reinforcement (P6h4).

Araw-araw po ay may drills kami ng mga bata na nag-uumpisa sa pagbilang at pagkilala ng itsura ng mga numero (P8h1).

Binibigyan ng drill araw-araw at may remediation sila sa math sa hapon mula Lunes hanggang Huwebes (P10h1).

Positive feedbacks and praises are also given to boost their confidence (P1h5).

More time, patience and lots of instructional materials used for them (P9h2).

Sa hapon naman ay may remedial session po kami para partikular na matulungan ang mga non-numerates (P8h2).

Ang mga activities sa mga aralin namin ay madalas ginagawa naming laro at binibigyan ng premyo ang nanalo upang sila ay maenganyong makinig at sumali sa talakayan sa klase (P8j1).

Imotivate muna ang mga bata bago mo sila bigyan ng bagong aralin para maengganyo sila at mas lalong magustuhan ang subject na Mathematics (P10j1).

These practices resonate with Skinner's (1953) behaviorist theory, which posits that reinforcement strengthens desired learning behaviors. Positive reinforcement through praise or rewards has been shown to increase student motivation and persistence (Schunk, 1995). On the other hand, Social Learning Theory of Bandura (1986) highlighted that motivation and self-efficacy improves when learners experience success and positive feedback.

Studies also support the notion that structured and repetitive drills improve the fluency and retention of basic math facts in learners with learning difficulties (Gersten et al., 2009). However, teachers must strike a balance between repetition and meaningful engagement to avoid rote learning dependency. The inclusion of remedial classes and individualized follow-up also reflects effective classroom management practices that help in sustaining continuous improvement.

Thus, reinforcement, motivation, and management of learning serve not only as behavior management tools but also as vital components of refining learners' confidence, competence, and sustained interest in mathematics.

4. Support Programs Assisting Non-Numerate Grade 1 Pupils

Theme 1: Implementation of Targeted and Individualized Support Programs.

Teachers emphasized that supporting non-numerate Grade 1 pupils begins with targeted and individualized interventions that focus on addressing foundational learning gaps in mathematics. These types of programs in the form of remedial classes and after-school tutorials are designed to provide learners with focused attention, continuous practice, and simplified lessons that cater to the needs of their level of understanding. These initiatives help learners to be given structured

opportunities that will help in strengthening their number recognition, basic operations, and overall mathematical confidence.

Remedial programs and after-school tutoring are designed to support non-numerate Grade 1 pupils by providing targeted assistance and reinforcing foundational numeracy skills (P1m1).

Focusing on basic math operations (addition, subtraction, multiplication, division) and addressing foundational gaps (P2m1).

Through this program, learners have constant practice and drills in math, and the lessons are simplified to ease the difficulty in learning math (P3m1).

Addressing foundation gaps, these programs start with the basics, ensuring students can recognize and write numerals, understand the quantity each numeral represents, and connect it to real-world objects (P10m1).

Gersten et al. (2020) emphasized that early numeracy interventions are most effective when they are clear, systematic, and targeted to meet the needs of learners. Dowker (2019) also highlighted that individualized instruction in arithmetic enriches the targeted, specific conceptual weaknesses of learners with low numeracy skills. The Department of Education (2013) also underscores that remedial instruction and catch-up programs are vital part of the National Learning Recovery Framework. This aligns the need for addressing the learning losses and foundational gaps in mathematics especially among early-grade learners.

Theme 2: Integration of Varied Instructional Materials and Learning Modalities.

This theme refers to the importance of integrating diverse instructional materials and multimodal learning approaches in supporting non-numerate learners. Teachers combines concrete, visual, and digital tools to make abstract mathematical concepts more meaningful and engaging. By utilizing these diffent manipulatives, visual aids, video lessons, and educational games, learners are given multiple entry points for understanding and retention. This caters the different learning styles of leanrers and maintain their learning attention throughout classroom instruction.

Use concrete objects first, then flash cards and window cards (P211).

Use video lessons on addition and other topics to retain them in their memory (P2I2).

Sa pamamagitan ng mga panoorin sa telebisyon sa tulong ng internet na may kinalaman sa mga pagtuturo ng pagbilang (P6I1).

Gumamit ng mga iba't ibang instructional materials na naaangkop sa kanilang aralin (P9I1).

Maari mo rin silang paghanap ng mga educational series at ipanood ito sa klase para mas maganahang matuto sa Math (P9I2).

Magandang bigyan pa sila ng mga resources chart o mga educational materials na may kasamang laro o tunog para mas makuha nila ito (P2p1).

More instructional materials, more worksheets, more manipulatives that the government should provide because not all teachers can afford these. A strong support system is needed for these struggling learners (P9p1).

These practices align with the Constructivist Theory of Bruner (1966). This theory described that learners build understanding through active manipulation of concrete materials before transitioning to abstract reasoning. Similarly, Clements and Sarama (2011) highlighted that utilizing developmentally appropriate manipulatives facilitates the progression of learners from physical exploration to conceptual understanding. In addition to that, Moyer-Packenham and Westenskow (2013) reveal that digital manipulatives and multimedia resources are effective source of enhancing both engagement and comprehension in early mathematics learning. Integrating the multimodal approaches which are visual, tactile, and auditory supports the diverse learning styles of learners. This also strengthens their cognitive processes (Piaget, 1972).

Theme 3: Collaborative Support, Monitoring, and Program Effectiveness. This theme refers to highlighting the vital role of teachers, parents, and other stakeholders in collaborating, monitoring, and supporting the school's programs. Teamwork among these people enhances program effectiveness and ensures that interventions are maintained.

Addressing these challenges requires creativity, flexibility, and a collaborative approach with other educators and support staff (P4l1).

Creating a positive school climate can go a long way in helping struggling learners overcome emotional barriers that impede their academic progress (P7l1).

Creating a positive school climate can go a long way in helping struggling learners overcome emotional barriers that impede their academic progress (P8l1).

Play-based learning program—this program encourages exploration and hands-on activities that develop math skills in a natural, engaging way (P3p1).

So many programs and interventions are created, but choose only what benefited our learners—start with Math Center Station and one-on-one support (P6p1).

Gumawa ng mga video lessons tungkol sa Matematika at ibahagi ito sa mga bata para mas matuto (P10p1).

Sa pamamagitan ng patuloy na pagtuklas ng mga karagdagang aktibidad at pagsasanay na makikita sa mga social media (P5p1).

Establish goals and monitor progress. Ensure there are opportunities to evidence how pupils have acted upon the feedback as a means of improving their work (P4p1).

Educating parents on how to reinforce math skills at home can create a more supportive learning environment (P7p1).

The theory of school-family-community partnership of Epstein (2018) emphasized the significance of collaboration among teachers, parents, and community stakeholders in fostering the success of learners. UNESCO (2022) also highlighted that sustained collaboration and effective monitoring mechanisms provide a significant contribution to the long-term success of foundational learning programs. Similarly, Shiel et al. (2021) supported that ongoing teacher collaboration and reflective practice enhance the delivery of programs and improve learning outcomes.

5. Targeted Intervention in Enhancing Math Teaching & Learning for Non-Numerate Grade 1 Pupils

Figure 3 presents the framework on the proposed targeted intervention in enhancing math teaching and learning for non-numerate grade 1 pupils. The framework is displayed as an 'X' in which consists of four boxes arranged symmetrically around a central square, forming the cross-shaped configuration. Each diamond represents one of the four research questions that emerged from this study: 1) Challenges faced by non-numerate grade 1 pupils, 2) Observed behavioral and engagement patterns of non-numerate grade 1 pupils, 3) Modified teaching strategies to accommodate the learning needs of non-numerate grade 1 pupils, and 4) Types of support programs available to assist non-numerate grade 1 pupils. The central box represents the Targeted Interventions which serve as the integrative core of the framework. The cross formation shows the interdependence of these aspects. This also emphasizes that the development of numeracy skills among grade 1 learners is influenced by these multiple, interconnected factors.

Furthermore, each box includes a hollow inner border that visually separate the overarching domains from its subthemes. This hollow space signifies depths and progression that provides movement from general insights to more specific, detailed understanding that brings the key principles in the proposed targeted interventions.

Conceptually, the framework underscores the cyclical and systemic nature of teaching and learning process in early mathematics. In the lower right box, challenges include math cognition difficulties, conceptual understanding gaps, and learner disengagement challenges. In the upper left box, the observed patterns include negative attitudes toward math, low confidence and shyness in math engagement, and dependence on manipulative and teacher guidance. In the lower right box, the modified teaching strategies were use of concrete, visual, and interactive learning materials, differentiated, scaffolded, and personalized instruction, and reinforcement, motivation, and management of learning challenges. In the upper right box, the support programs were implementation of targeted and individualized support programs, integration of varied instructional materials and learning modalities, and collaborative support, monitoring, and program effectiveness.

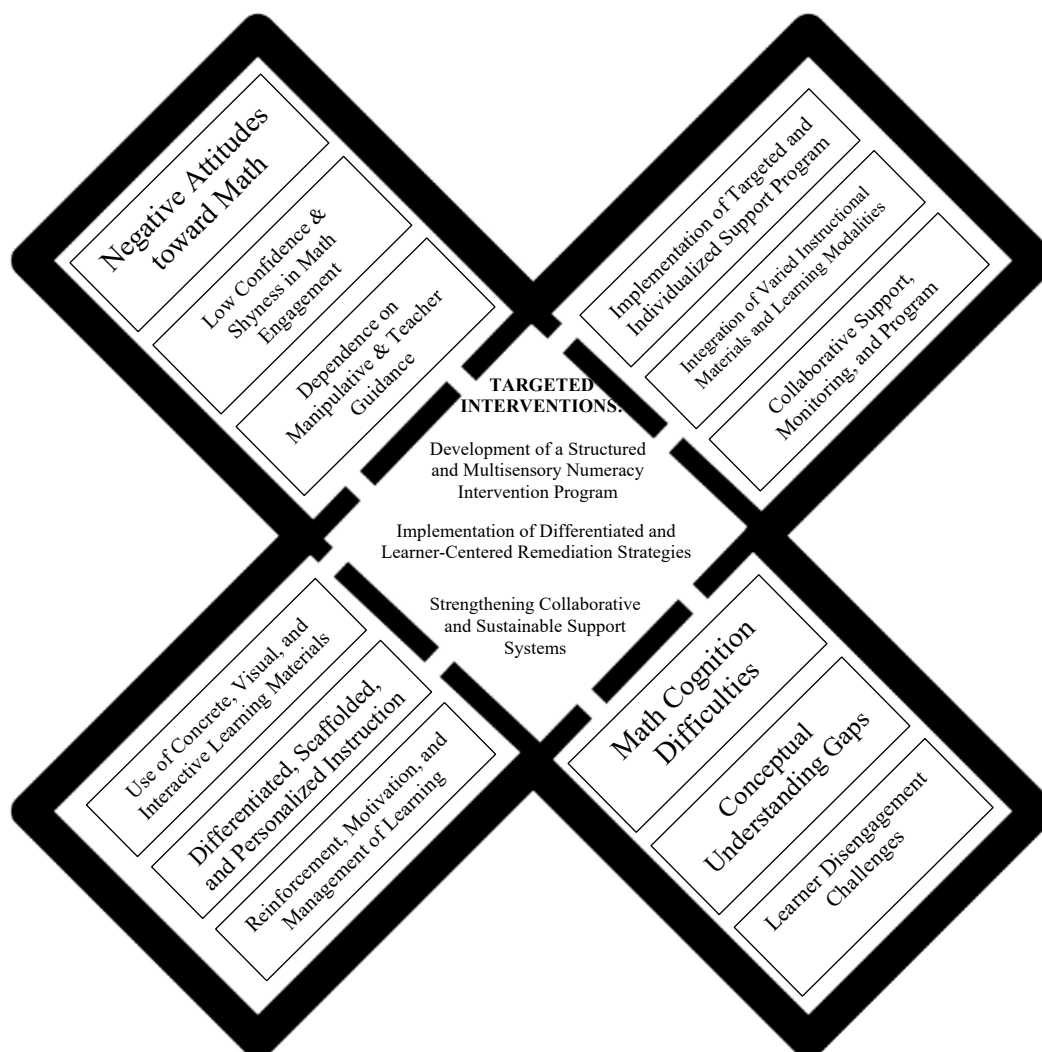


FIGURE 3
TARGETED INTERVENTIONS FOR ENHANCING NON-NUMERATE
GRADE 1 PUPILS

IV. CONCLUSIONS AND RECOMMENDATIONS

This chapter contains the summary of findings, the conclusions formed, and the recommendations offered.

Summary of Findings

The following were the summary of the findings:

1. Themes emerged for the challenges faced by non-numerate Grade 1 pupils in understanding basic mathematical concepts include 1) Math Cognition Difficulties (poor number sense, weak retention, and slow processing of basic mathematical concepts), 2) Conceptual Understanding Gaps (difficult to grasp the meaning behind mathematical operations and symbols), and 3) Learner Disengagement Challenges (pupils losing focus easily, showing little interest in the subject, and needs continuous prompting to stay attentive).
2. Themes emerged for the observed behavioral and engagement patterns of non-numerated Grade 1 pupils during mathematics classes include 1) Negative Attitudes toward Math (pupils perceived it as difficult or intimidating), 2) Low Confidence and Shyness in Math Engagement (pupils hesitate to answer or participate in class discussion), and 3) Dependence on Manipulatives and Teacher Guidance (pupils show limited ability to work independently & heavily rely on visual aids and constant supervision).
3. Themes emerged for modifying teaching strategies to accommodate learning needs of non-numerate Grade 1 pupils during mathematics instruction include 1) Use of Concrete, Visual, and Interactive Learning Materials (use of various manipulatives, flash cards, and video lesson to make math more tangible and relevant), 2) Differentiated, Scaffolded, and Personalized Instruction (use of targeted pedagogies that suit to each of the learner's level of understanding),

and 3) Reinforcement, Motivation, and Management of Learning Challenges (use of positive encouragement, rewards, and remedial sessions).

4. Themes emerged for types of support programs available in assisting non-numerate Grade 1 pupils include 1) Targeted and Individualized Support Programs (remedial classes, after-school tutoring, and diagnostic assessments), 2) Integration of Varied Instructional Materials and Learning Modalities (multimedia lessons, play-based tasks, and localized teaching strategies), and 3) Collaborative Support, Monitoring, and Program Effectiveness (involving teachers, school heads, local government, and other stakeholders to ensure consistent progress and resource allocation).
5. The study proposes targeted intervention in the forms of: 1) Development of a structured and multisensory numeracy intervention program (integrating visual, tactile, and auditory learning experiences), 2) Implementation of differentiated and learner-centered remediation strategies (providing individual learning needs and readiness levels), and 3) Strengthening collaborative and sustainable support systems (maintaining continuous resource allocation and monitoring of learners' progress through teachers, school heads, and stakeholders).

Conclusions

The following were the conclusions based on the above-indicated summary:

1. Grade 1 non-numerate learners experience challenges hindering their foundational mathematical learning in the form of: math cognition difficulties, conceptual understanding gaps, and learner disengagement challenges.
2. Grade 1 non-numerate learners show behavioral and engagement patterns during mathematics classes which are described as negative attitudes toward math, low confidence and shyness in math, and dependence on manipulatives and teacher guidance.

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3. Teaching strategies are modified to accommodate the learning needs of non-numerate grade 1 learners. Teachers employ the learning materials that are concrete, visual, and interactive, with instructions that are differentiated, scaffolded, and personalized, and learning that is reinforced, motivational, and managed.
 4. Various support programs in improving numeracy skills of Grade 1 non-numerate learners implemented in Bacolor North District include the implementation of targeted and individualized support programs, integration of varied instructional materials and learning modalities, and collaborative support, monitoring, and program effectiveness.
 5. Proposed targeted interventions of the study require the development of a structured and multisensory numeracy intervention program, implementation of differentiated and learner-centered remediation strategies, and strengthened collaborative and sustainable support systems. The interconnection of these programs is illustrated in the developed framework of the study and can be utilized as a guide for implementing these interventions.

Recommendations

The following are the recommendations based on the conclusions:

1. Schools may implement early screening and diagnostic assessments to determine pupils with difficulty in mathematical cognition and concepts at the beginning of the school year. Teachers should be equipped and innovate teaching strategies that focus on strengthening number sense, sequencing, and comprehension of mathematical operations.
2. Teachers may enrich a supportive, interactive, and encouraging classroom environment to mitigate learners' negative attitudes and low confidence toward

math. Pupils should also be gradually encouraged to develop independence by minimizing their reliance on manipulatives and teacher assistance.

3. Schools are encouraged to support teachers in utilizing concrete, visual, and interactive learning materials, participating in capacity building programs, and enriching reinforcement, motivation, and management of learning.
4. Schools are encouraged to promote and develop their existing remedial and after-school programs. This will ensure the continuous support of non-numeric learners. Collaboration among key stakeholders is also necessary to ensure the effective monitoring and evaluation of the programs.
5. The study proposes the implementation of targeted interventions by adopting and implementing the proposed framework in enhancing the teaching-learning process for non-numerate Grade 1 pupils.

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