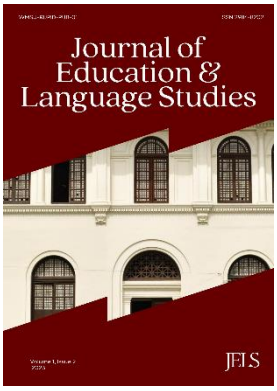

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The Struggles in Numbers: Challenges Experienced by Non-Mathematics Major in Teaching Math Intervention Program

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Abstract

This descriptive research investigated the challenges experienced by non-mathematics major teachers facilitating the math intervention in the Philippines. Due to a shortage of specialized teachers, non-majors often facilitate these critical interventions. This study utilized thematic analysis based on a semi-structured interview and focus group discussions with 12 non-mathematics majors. Findings revealed that teachers struggled profoundly with content knowledge and lesson preparation due to limited background, often relying heavily on scripted lessons and online tutorials to cope, albeit, they employed strategies like peer mentoring and technology during execution. In conclusion, addressing these systemic issues through comprehensive training and structured mentoring is essential for the success of math intervention programs.

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Introduction

Mathematics is regarded as one of the hardest subjects. It is a subject that deals with numbers, problem-solving, logic, and numerical calculations. Understanding mathematics is important as it is crucial in developing students' logical thinking skills. During the COVID-19 pandemic, the education system was put in jeopardy. The pandemic has caused classes disruption which resulted in a lagging educational system. This unfortunate event is manifested in the way learners learn mathematics.

In 2022, the Philippines has joined the Organization for Economic Cooperation Development (OECD) Programme for International Student Assessment (PISA) Examination. The results revealed that the 15-year-old exam takers scored an average of 355 in mathematics, slightly increasing from the 353 average scores in 2018. However, the result still falls under the OECD average. This result implies that, at a minimum, Filipino students can interpret and recognize how simple situations can be represented mathematically, even without direct instructions.

Another international assessment that the Philippines participated in is the Trend in International Mathematics and Science Study (TIMSS) 2019. Results revealed that the Philippines scored 297 in mathematics and 249 in science, the lowest among 58 countries involved in the study. This result indicates that Filipino students do not meet the international science and mathematics achievement average.

To help in the improvement of the mathematics competence level of the students, the Department of Education (DepEd)-Schools Division Office of Zamboanga City has initiated the D'Numat and ALAMath program, two

intervention programs facilitated by math teachers that aim to help students gain competency in mathematics.

In school year, 2024-2025, the Department of Education Central Office announced the integration of the National Mathematics Program (NMP) as a program integrated into the student's class schedule. This program was released through DepEd order no. 10, series of 2024 or the Policy Guidelines on the Implementation of the MATATAG Curriculum and as mandated by DepEd order no. 13, series of 2023 or the Adoption of the National Learning Recovery Program in the Department of Education. This program promotes and enhances numeracy and mathematics learning in schools across all grade levels. Its goal is to improve the understanding of numeracy and its critical connections with mathematics in the real world, increase the system-wise capacity to implement key principles in developing numeracy and mathematics skills and increase the availability of broad and reliable data on numeracy and mathematics progress and achievement. In school year 2025-2026, the Department of Education has again announced the implementation of the Academic Recovery and Accessible Learning (ARAL) Math through DepEd Order 018, s. 2025 also known as the implementing guidelines of the Academic Recovery and Accessible Learning Program. The implementation of the ARAL-math is set in school year 2026-2027, but the schools division has rolled out the implementation of ALAMath, in this locally initiated program, students ALAMath class will be handled by non-mathematics major.

The different math interventions initiated by the national and local offices are projects that aim to improve the competence of learners in mathematics. However, these programs also entail a challenge for the teaching force. These programs are supposed to be taught by mathematics majors. However, with the shortage of specialized math teachers and math teachers handling the regular mathematics load, the school has no choice but to give out the math intervention loads to non-mathematics major teachers. With this, the program and the teachers are placed in compromise.

Teachers teaching subjects that are not the major they took in college have been rampant in the educational landscape. It has been a common scenario especially at the secondary level. In August 2024, the Second Congressional Commission on Education (EDCOM II, 2024) reported that six (6) out of ten

(10) teachers teach subjects outside of their major. The Second Congressional Commission on Education has said that from the 700,000 data sample of public-school teachers, 62% are handling subjects that are not their major in college. This major mismatch has been associated with the PISA scores, questioning students' capability to raise the PISA scores when the ones teaching them are not experts in their field.

Mathematics education has faced different challenges in the field, including a need for more resources, teacher qualifications, and mathematics pedagogy. Villanueva et al. (2024) explored mathematics education in the Philippine context. It revealed that Filipino learners are far behind neighboring Asian countries' math competencies despite curriculum reforms and pedagogical innovations. One possible reason for this disparity is the need for more alignment between the curriculum and assessment objectives and the discrepancies between the content taught to the students and the skills assessed by the standardized international standards. Furthermore, the student's socioeconomic status also plays a vital role in mathematics competence. It was shown that students from affluent family backgrounds have higher mathematics skills than those from disadvantaged backgrounds. It was revealed that students who can afford tutorials and access technology perform better than those who cannot. The qualifications of the math teachers also play a crucial role in the mathematics education landscape. It was found that the teachers' qualifications, teachers' content knowledge and pedagogical skills have significantly influenced students' performance. The study also underscores the challenges in curriculum implementation. Discrepancies were found between the intended curriculum goals and the instructional methods employed in mathematics classrooms. The teacher's struggle needs help to effectively translate curriculum objectives into meaningful learning experiences for the learners, resulting in a compromise in the learning outcomes. After the pandemic, the education landscape has struggled to recover. In the study of Atweh et al. (2023), they found that mathematics education should be technologically responsive. Limited infrastructure, particularly in rural areas, highlighted disparities in access to technology. The education sector should also focus on pedagogy. The study calls for a reevaluation of mathematics teacher education post-pandemic. It stresses the need for curricula incorporating more flexible and equitable practices and technologies and a deeper engagement with students' social and

emotional needs. The authors advocate for a long-term, responsible response to the changes in education brought about by the pandemic.

The phenomenon of teaching subjects outside one's area of specialization, often referred to as out-of-field teaching, presents a complex display of pedagogical and psychological hurdles for educators. According to Barbadillo (2021), this major-subject mismatch frequently stems from institutional needs, such as math teacher shortages, forcing specialized teachers to handle loads for which they have no formal training. This transition is often marked by significant emotional distress; while Raymundo (2021) notes feelings of nervousness and disappointment, Yumang (2021) characterizes the experience as a period of hardship and professional sacrifice.

At the Center of the struggle of non-major teachers is a perceived lack of content mastery and pedagogical confidence. Barbadillo (2021) observes that a lack of specialized knowledge often restricts teachers to teaching by the book, while Raymundo (2021) highlights a pervasive fear among educators regarding their inability to answer student inquiries or select appropriate teaching methodologies. This sentiment is confirmed by Yumang (2021), who identifies the burden of curriculum planning and the scarcity of specialized learning resources as primary barriers to effective instruction. Consequently, the teaching quality and student learning experience may be compromised as teachers exert disproportionate time and effort just to stay ahead of the daily curriculum.

Despite these challenges, research indicates that teachers employ various adaptive strategies to maintain instructional efficacy. Raymundo (2021) and Yumang (2021) both emphasize the critical role of social capital, noting that peer mentoring, coaching, and collaboration with school administrators are vital for reducing teacher stress and enhancing subject familiarity. Furthermore, the experience of teaching unfamiliar subjects is often framed as a paradox of professional development. While the initial years are marked by low confidence, Barbadillo (2021) notes that familiarity increases over time, and both Raymundo (2021) and Yumang (2021) conclude that this forced adaptability eventually fosters well-rounded educators and life-long learners who gain new perspectives by moving beyond their professional comfort zones.

With the major teaching load misalignment, the teacher's identity in teaching becomes questionable. According to Crisan and Rodd (2017), it is important to understand how non-specialist teachers develop their mathematics teacher identity and allow them to grow professionally by developing more effective in-service courses for non-specialist teachers.

With this context, the study was conceived to systematically investigate the challenges and practical implications of current policies that assign non-mathematics major teachers to implement mathematics intervention programs. This inquiry is particularly relevant to the field of education, as it directly examines the intersection of teacher preparation, instructional quality, and policy implementation, three critical determinants of learner achievement in mathematics. By documenting the lived experiences of non-specialist teachers, the study contributes empirical evidence to ongoing discussions on teacher deployment, subject–major alignment, and instructional effectiveness within the public school system.

Moreover, this research serves as a call to action for both current and future policymakers, school administrators, and curriculum planners. The findings highlight gaps between policy intent and classroom execution, underscoring the need for evidence-based review of intervention programs, targeted professional development, and structured support mechanisms for teachers teaching outside their specialization. By revealing these challenges, the study provides a foundation for informed decision-making and policy refinement aimed at strengthening mathematics instruction, enhancing teacher capacity, and ultimately improving student learning outcomes.

This study sought to answer the following questions:

1. What are the challenges faced by non-mathematics math intervention teachers?
2. What support does the school administration give to non-mathematics teachers teaching the math intervention program?

This study is delimited to identifying the challenges that the non-mathematics major teachers teaching math intervention programs are facing in implementing the program. The study also explored the support that the administration gives to the non-mathematics teachers in

implementing math intervention programs. The scope of the challenges the teachers face is from the preparation, execution, and evaluation of learning. In gathering data, the researchers used a semi-structured interview followed by a focus group discussion (FGD) that focused on the challenges non-mathematics teachers face in teaching math intervention programs. Only non-mathematics major teachers teaching math intervention programs were admitted in participating in the study.

Methods

This research utilized qualitative research methods specifically, descriptive design using semi-structured interview and focus group discussions. Thematic analysis was used to explore the experiences of non-mathematics major teachers teaching math intervention programs within a single school context. The qualitative descriptive approach was chosen to provide a straightforward and comprehensive account of participants' experiences using language close to their own. This method is appropriate for the study as the data collected from the participants were qualitative data which was analyzed through thematic analysis. The study also collected the demographic profile of the participants. This demographic profile was used to describe the population of the research and explain the challenges non-mathematics major teaching mathematics contextually.

Research Participants

The study's respondents are the non-mathematics major teachers teaching Math interventions at Bolong National High School. Bolong National High School is a secondary public school located 35 kilometers away from Zamboanga City Proper. It is located at the second congressional district of the city and part of Manicahan District. The school consists of 25 junior high school teachers and 11 senior high school teachers. The math intervention programs are carried out for junior high school students only and 13 teachers of various undergraduate majors are handling these classes, 12 of which are non-mathematics majors. Since only a few teachers teach mathematics intervention, the total enumeration method was used in selecting the study respondents. A survey of the participants' demographic profile was made for contextual purposes, these are shown as follows:

Table 1

Participants' profile

Characteristic	Description
Age range	20-60 years old
Teaching specialization	Non-mathematics majors
Years of teaching experience	1-25 years
Grade levels handled	Grade 7-10
Educational Attainment	Bachelor's to master's Level

Table 1 presents the general profile of the participants included in the study. The participants consisted of twelve (12) non-mathematics major teachers assigned to teach mathematics intervention programs at Bolong National High School. They represented a range of age groups, years of teaching experience, academic backgrounds, and grade levels handled, reflecting diversity in professional experience and educational preparation. All participants were handling mathematics intervention classes for Grades 7 to 10 during the time of data collection. Their educational attainment ranged from bachelor's degree holders to teachers with master's units and completed graduate degrees.

The demographic information was collected to provide contextual background for understanding the teaching environment and professional circumstances of the participants. These characteristics were not used as variables for comparison or analysis but served solely to situate the findings within the specific school context of the case under study.

Research Instruments

This research utilized a researcher-made semi-structured interview guide. The interview guide consists of 25 questions that relate to the teacher's difficulty in the preparation, execution, assessment, and reflection of learning in teaching math intervention programs. The interview guide was validated by three (3) field experts. One (1) of whom have a degree in Doctor of Philosophy in Instruction and Supervision, one (1) with a degree in Doctor of Philosophy in Developmental Studies major in Educational Administration, and one (1) with a degree in Doctor of Philosophy in Mathematics (Cand.). This was employed in a semi-structured interview and focus group discussion manner.

Data Gathering Procedure

The researchers sought permission from the office of the School Principal. After permission was granted by the principal, informed consent was obtained from the study respondents. The researcher scheduled an interview to the participants and focus group discussion with the respondents. These were done during the collaborative meeting time when the teachers are free. For the FGD, the group was divided into two. Two FGDs were scheduled to give every respondent an equal chance to voice their thoughts on the interview questions.

The research study was conducted according to the following ethical guidelines. This protocol includes:

Obtaining the informed consent of respondents in the research. To include an explanation of the purpose of the study, as well as their rights to the result and the reporting of the data. It also included the duration of the study;

Explaining the respondents' right to withdraw from the research at any time should they wish to do so for their awareness;

Explaining that the FGD will be audio-recorded for transcription later; and

Respect for privacy, confidentiality, and anonymity of the respondents. Only the researcher can access the raw data, which will be kept confidential. The study results from this school would not be used directly or indirectly against any respondents. The data collected following the protocol will be kept for the next three years after study completion and destroyed after the fifth year of the study.

After the focus group discussion, the data will be transcribed and will be presented in a thematical manner.

Data Analysis

Basic descriptive summaries were used solely to present participants' background information for contextual purposes. No statistical analysis was conducted.

Thematic analysis. This was used to analyze the data according to the emerging themes from the gathered data.

To ensure the minimization of analysis bias in the interpretation, three (3) of the researchers have independently identified codes to the same data. These codes were compared and examined thoroughly. After meeting and discussing the codes and patterns observed by the researchers, the researchers come up with the different themes that resolve the differences and ensure the consistency and depth in meaning of the gathered data.

As a validation process, the result of the inter-coding was then presented to the participants. The participants were given the chance to validate the coding result to address possible biases in the interpretation of codes and themes. After the evaluation of the participants, the themes were finalized.

Results and Discussion

The Challenges Faced by Non-Mathematics Math Intervention Teachers

Thematic analysis of how non-mathematics majors are greatly affected in teaching math intervention program was done. Four emerging themes have emerged from the responses of the research respondents**.** A semi structured interview was done which was followed by an FGD. Participants were asked questions regarding the challenges they faced in teaching mathematics intervention program. The interview guide was divided into challenges that the teachers faced in their preparation, execution, assessment, and reflection.

Theme 1: Content Knowledge and Lesson Preparation

When asked what challenges they face when preparing to teach math as a non-mathematics major, many respondents have difficulty in understanding the lesson as they have limited background of the content. Teachers struggle to grasp the depth of mathematical content due to their non-mathematics background. This aligns with Barbadillo's (2021) theory on out-of-field teaching, which suggests that teaching quality is negatively affected when teachers handle subjects outside their specialization due to limited content knowledge. This is shown in frame 1.

Frame 1: Content Struggle and Self-doubt

> "*I find it difficult to contextualize content to the level of the students as me myself do not fully understand the concept of the content*." – R008
>
> "*I need more time to study the topics before teaching, and it takes me longer to prepare than my regular subject.*" – R001
>
> "*I struggle most of the time in explaining math concepts especially with the complex or higher concepts of math.*" – R002

This frame reflects the fear which mirrors the findings of Raymundo (2021), who noted that out-of-field teachers often feel bad, nervous, or hesitant about teaching subjects far from their major, fearing the unknown.

When asked how they tackle planning math lessons without having an in-depth background in mathematics, many respondents have cited studying the topic in advance.

Frame 2: Practice and Collaboration

> "*I study the content and practice exercises.*" – R003
>
> "*Collaborate and consult resources, learn from colleague experiences and ask materials to fill gaps in content familiarity.*" – R006

Frame 2 shows the respondents responses which points out that if they only have enough resources and ample time to prepare, they may have better understanding of the topic and be able to deliver the content at the level of the students. This struggle makes them question their confidence in teaching the lesson. This is presented in frame 3.

Frame 3: The Diminishing Confidence

> "*I am afraid to go beyond or lower the lesson content as I am not sure if I am still doing the right thing.*" – R009

To tackle these challenges represented by frame 3, the respondents are planning math lessons and enhancing their conceptual knowledge in mathematics through watching YouTube video tutorials, studying lessons through practice, seeking support from subject experts, using structured materials.

Some break down the lesson into comprehensive pieces of information that will not mentally drain them and the students and some just rely on the prepared lesson script of the mathematics intervention program class. This reliance on external resources validates Barbadillo's (2021) observation that teachers often cope by searching the internet or asking peers for help.

Frame 4: Going Back to Tradition

> "*I just copy paste the lesson script (content) in my power point presentation and just follow what is there to avoid mistakes, they say, less talk less mistakes.*" – R008

Frame 4 reflects Sani and Burghes' (2022) findings that experienced teachers often revert to novice behaviors when retraining for math, sticking rigidly to lesson plans because they lack the depth to discuss topics freely. To overcome these challenges in content and resources and some teachers have adopted some coping mechanisms such as studying ahead of time, watching math tutorials. Some have cited engaging in professional development activities. This is shown in frame 5.

Frame 5: Collaborative and Professional Development Efforts

> *"I read more reference, a reliable one and ask for help by asking guidance and opinions from my colleagues. I also attend seminars where I learned strategies in handling non-major subject."* – R002
>
> *"In-Service Training (INSET) and School Learning Action Cell (SLAC) session where teachers shared useful math teaching strategies and how numeracy is integrated across subject areas would be a great help."* – R001
>
> *"I have attended few online webinars that involves teaching strategies that are useful in teaching mathematics."* – R005

Frame 5 reflects that even when teachers have difficulty in understanding mathematical concepts, they are willing to just be there in the classroom to deliver what is asked and expected from them. Ultimately, these findings illustrate that while out-of-field teachers are burdened by a profound content-gap that forces them into rigid, novice-like instructional behaviors, their persistent engagement in self-study and peer collaboration emphasizes a resilient professional commitment to delivering the curriculum despite their own conceptual insecurities.

Theme 2: Differentiation and Student Engagement

When asked how they differentiate their lesson plan to meet the diverse needs of students in their math class, some teachers modify their lesson by simplifying concepts, preparing hands-on activities such as board-work and seatwork. R003 cited that she only revises very few content altering numbers in the example to be given in the seatwork.

Frame 6: Levels of Instructional Adaptation

> *"I do alter some of the given examples to be my seatwork items,"* – R003

Frame 6 explains that doing differentiation gives her new items in seatwork but still follows the process in the example. Some with a little grasp of the lesson such as those who are teaching science have cited that they sometimes give differentiated instructions to the students. They give more examples to those advanced students and simpler examples to students who are struggling. However, some do not really differentiate the lesson as they would only follow the given guide as it is as they do not feel confident that what they do is correct. This confirms with Llurag et al. (2024), who identified that teachers often struggle to differentiate instruction to meet diverse proficiency levels due to their own inadequate subject knowledge.

> "*I do not alter anything, I give what is in the script, I do not have the capacity to differentiate my instruction.*" – R010

With the struggle in teaching unfamiliar concepts, non-mathematics major teachers resort to removing examples and items they do not understand. R004 shares he does not give examples that he himself does not understand and does not know how to explain.

> "*I skip examples that I do not understand the process and the answer. If I am confused, what more my students.*" – R004

This frame confirms Barbadillo's (2021) finding that out-of-field teachers tend to teach by the book and may skip lessons they do not personally understand. This revelation was agreed by most of the mathematics intervention teachers.

Essentially, this reveals that effective differentiation is predicated on subject mastery; for non-major teachers, the struggle to simply understand the process creates a barrier that prevents the transition from rigid, one-size-fits-all delivery to responsive, student-centered instruction.

Theme 3: Instructional Delivery and Classroom Management

Despite these challenges faced by non-specialized teachers in content and planning, they still try to keep up and maintain student engagement during math lessons especially when they do not feel confident in teaching the content. Few of them attempt to use fun games and group activities so students stay active and engaged. This is shown in frame 7.

Frame 7: Student engagement

> *"I keep students engaged by using interactive activities and real-life examples even if I am not fully confident in the content, I try to make a positive and supportive learning environment."* – R007

While teachers struggle in maintaining student engagement, they also need to manage classroom dynamics during math instruction particularly when students struggle with the material. Most of the teachers cited giving feedback and maintaining a supportive environment as a strategy. R004 cited giving extra support to struggling students. R005 and R001 pairs students (peer mentoring) who are advanced learners and slow learners. They help each other in the process of learning. Some teachers encourage students to ask questions if they find the lesson difficult. Some also allow students to do groupwork so that they will be able to help each other understand the lesson. Some provide additional practice exercises and reteach when necessary. On the other hand, one respondent pointed out that sometimes she just goes on with the lesson and selectively answers questions raised that she could answer as she sometimes does not know what to answer to the questions raised.

This echoes Yumang's (2021) findings, where teachers reported struggling to confidently answer students' questions due to a lack of expertise. When asked how they balance teaching math content ensuring students develop critical thinking and problem solving skills, some teachers pointed out integrating Higher Order Thinking Skills(HOTS)-Statement of Learning Outcomes (SOLO) questions and open-ended questions in their discussion, others are relating the topics in real-life situations, but others have admitted that they are not sure whether they are able to balance teaching math content to develop critical thinking and problem solving as some of them are simplifying lessons for their benefit and the students.

> *"Sometimes I do not follow the lesson script as I also have difficulty in understanding the sample problems."* – R009

Keeping on track with the lesson you are not familiar with is a difficult task. One effective strategy to stay on track is the use of effective instructional materials that will guide the teacher and their students. When teachers were asked about the tools, technology, or manipulatives they use to support math teaching, teachers used video tutorials and PowerPoint presentations.

Video tutorials are used by some teachers to explain the lesson. In this way, the teacher only comes in to clarify what the students did not understand. This also helps teachers who are not well versed with the content. The PowerPoint presentation on the other hand helps them stay on the parameters of what is supposed to be taught. This helps them avoid erroneous inputs that may confuse students. Most of the teachers find these video tutorials and PowerPoint presentations helpful to stay on track with the lesson. This is shown in frame 8.

Frame 8: Outsourcing Instruction through Technology

> "*Yes, I do use technology depending on the topic, especially when I need to visualize the topic.*" – R005

This need for technology to support effective teaching is expressed by Villanueva et al. (2024) and Llurag et al. (2024) which said that adaptive technology integration is recommended for students' growth and for effective teaching process. Math is indeed a challenging subject for the non-mathematics major. The anxiety of teaching a nonfamiliar subject is felt by the teachers, but their anxiety is kept as this may be projected when teaching. This anxiety is also seen in students who are not good at math. When the teachers were asked about how they handle students who have anxiety in math, many teachers give encouraging and supportive environment to make the students feel comfortable.

Frame 9: Psychological Support and Anxiety Management

> "*I praise their effort and remind them that it is okay to make mistakes.*" – R002
>
> "*I always encourage my students by sharing positive experiences that could inspire them and saying that making mistakes is part of the learning process.*" – R001

Frame 9 shows the positive attitude that the teachers show to the students that is rooted to their need to appear in command of the lesson and that they have the knowledge to share with the students. Moreover, to maintain student engagement during math lessons, especially when they do not feel fully confident in the content, some teachers said that they give problems that are easy to solve so that the students will feel rewarded when they get the correct answer. They also give out hands-on activities for students to

solve which some will be answered on the board and on their seats. They also give longer time for students to answer the activities. This strategy helps the students have more time to answer questions as well as it helps the teachers stay on track with what was to be discussed in a day. Since some teachers rely solely on the lesson script, giving the students longer time to answer the problems kills time. This results in lesser exposure of students to the lesson. One responded and even pointed out that when she does not know what is happening already, she would turn around and reflect for a while, face the students again as if she knew the lesson well.

The respondents were asked what strategies they use to simplify or breakdown complex math lessons for students, many of the teachers start by reviewing basic concepts before introducing a more complex material, some use a step-by-step method of problem solving with simple examples, some use explicit method by demonstrating how a problem is solved, some uses traditional lecture methods by letting students copy the lecture and sample problems. This reversion to teacher-centered methods is consistent with the findings of Atweh et al. (2023), who noted that educators facing a steep learning curve often rely on familiar, less interactive methods, effectively creating a banking model of education.

The findings reveal that without subject mastery, teachers inevitably revert to teacher-centered banking models and time-filling strategies, suggesting that while student engagement may be maintained through positive reinforcement, the depth of mathematical inquiry is often sacrificed for instructional survival.

Theme 4: Assessment and Reflection

In terms of assessing students' learning, the teachers were asked about their ways of assessing students' understanding of math concepts without a deep math background to draw from. Some teachers give formative assessments and summative assessments, board work, seat work, and group activities. These assessment strategies were effective in keeping the students busy and occupied during the lesson presentation. R001 gives simpler activities and asks students how they got the answer while R005 sticks to the competencies and constructs questions based on it.

However, the teachers raised concerns about checking the papers. Giving activity that is provided in the lesson script is easy but checking whether the answer is correct is their main concern as students are sometimes creative in how they solve problems. Some teachers are not equipped with the knowledge to check the process of solving math problems unconventionally. This results in their difficulty interpreting the effectiveness of their teaching. Not fully understanding the content limits them from interpreting answers in the assessment which limits their actions to make their teaching fitting for their student's level. This supports Copur-

Gencturk and Tolar's (2022) conclusion that specialized content knowledge, such as evaluating unusual student answers requires both conceptual understanding and mathematical reasoning, which non-mathematics major teachers often lack. Some teachers resort to using generative artificial intelligence in checking the students' answers. Despite this, when asked which assessment strategy they used were effective in checking understanding, most of them pointed out formative and summative assessments. R001 on the other hand finds board work effective especially in giving feedback on the spot. This is shown in frame 10.

Frame 10: Real-Time Feedback

> "*I find board work most effective because I can see who understands the lesson and who needs more help.*" – R001

Assessment results are very effective in feedbacking which allows teachers to recalibrate their teaching strategies. When asked how they adjust their teaching based on the results of math assessments, R010 uses the results of the assessment by giving extra practices and sometimes reteaching the topic. This serves as good practice for teachers. However, since most teachers are not so knowledgeable about the topic, some teachers neglect the result and just go on with the lesson sequence in the lesson script. When asked what ways they do to ensure that their math assessments are fair and aligned with the learning goals, majority of the respondents are only relying on the given items in the lesson script.

The challenges the teachers face in assessing students' learning affects how they perceive their effectiveness as math intervention teachers. When asked how they reflect about the effectiveness of their mathematics instruction,

majority of the teachers use the outputs and assessments results as a measure of their teaching effectiveness. Some teachers feel somehow effective because they see that their students can answer seatwork, board work, and quizzes. Aside from this, they also get feedback from the students. Majority of the teachers gather feedback through the assessment given. R001 on the other hand shared her strategy in checking feedback during the class discussion.

> "*I use hand signals like thumbs up if they get the lesson and thumbs down if they are still confused.*" – R001

After gathering feedback and scores, some of the teachers go on self-reflection, asking which part of the lesson was delivered correctly and which part of the lesson posed a challenge to them. Some teachers are not confident to say they were effective mathematics intervention program teachers as they feel their knowledge and their teaching styles were not enough. Despite this, they remain optimistic. When asked to describe a time when they learned something new about teaching math that changed their approach or perspective majority of the teachers used these learnings to improve their teaching styles. Some teachers learned new strategies in teaching problem solving skills, some learned to answer math problems in different methods with the same principles applied, some learned to connect lessons to real life situations. When asked what ways they do to continually adapt their teaching methods to improve student learning in math, considering they are of non-math major background, they cited being open to new opportunities to learn. This is shown in frame 11.

Frame 11: The Resilience of the Accidental Math Teacher

> "*I always learn from my experiences and from the feedback from my students.*" – R002
>
> "*I look for ways to explain math, and I listen from a math teacher's advice.*" – R001

The teachers have cited several ways to develop their teaching skills this refers to attending SLAC session if there are anything given, webinars, and video tutorials. The teachers are adaptive and resilient. They want to be effective in teaching math, and they are united in saying that they are willing to learn and that they are willing to give more to the students if they are only

given the right support and a longer time to prepare for their classes. This bittersweet experience parallels Yumang's (2021) study, which found that despite the struggles, out-of-field teachers often view the experience as an opportunity to move out of their comfort zones and become well-rounded educators. They could have been better mathematics intervention program teachers if the lessons they are teaching were thoroughly understood by them.

These findings suggest that while non-major teachers are highly resilient and capable of fostering a supportive affective environment, their lack of specialized content knowledge creates a feedback ceiling that prevents them from accurately diagnosing student misconceptions or validating unconventional problem-solving processes.

Administrative Support Provided to Non-Mathematics Teachers

Theme 5: Administrative Support

The respondents were asked regarding the administrative support they get in implementing mathematics intervention programs. Some teachers pointed out that they did not get any professional development program to enhance their teaching skills in math. There were no SLAC provided that was administration initiated. Despite this shortcoming, the teachers pointed out that the mathematics coordinator stepped up in his role by providing technical support to the teachers who approached him to ask for help.

Raymundo (2021) similarly found that teachers often rely on key teachers or peers for survival in the absence of formal support. While the administration lacks technical support, they, on the other hand, provide support in terms of supplies such as bond papers and ink for lesson script printing. The teachers, in unison, have pointed out that the administrative support is lacking and that it does not address their concerns in teaching mathematics intervention program to the higher authority. This highlights the systemic issue identified by Hobbs and Porsh (2021), who noted that out-of-field teaching is often normalized but systematically unsupported by school leadership. It seemed to them that the administration is also just after the implementation of the program and compliance with the policy.

When asked what the administration can do to help them develop the necessary skills and knowledge they need to teach mathematics intervention program, they answered attending a seminar in math, mentoring session from an experienced math teacher, providing professional development, providing resources, and providing ways for mathematics intervention program teachers to collaborate like SLAC sessions would be a great help. This demand for structured support is crucial, as Sani and Burghes (2022) argue that retraining courses alone has little impact without ongoing collaborative support.

The findings of the study highlight the multifaceted challenges faced by non-mathematics major teachers in delivering mathematics intervention programs, revealing a gap between policy implementation and actual classroom experiences. These challenges span across all phases of teaching from preparation to reflection and emphasize a broader systemic issue of insufficient professional development and support for these teachers.

Conclusion and Recommendation

This study explored the challenges faced by non-mathematics major teachers in delivering the mathematics intervention program, as well as the extent of administrative support provided to them. The findings revealed that these teachers encounter significant difficulties in lesson preparation, content delivery, assessment, and classroom management due to their limited background in mathematics. Their lack of confidence in understanding and teaching the subject often results in a reliance on scripted lessons, video tutorials, and simplified instructional strategies, which may compromise the depth and quality of student learning.

Despite these challenges, many of the non-mathematics major teachers demonstrate a genuine commitment to their students and a strong willingness to improve. However, their efforts are hindered by the absence of structured professional development, minimal mentoring opportunities, and limited administrative support beyond logistical provisions. The gap between policy implementation and actual classroom support places undue pressure on these teachers and raises concerns about the effectiveness of the program in meeting its educational goals.

Ultimately, for the mathematics intervention program to succeed, it is imperative to address the systemic issues that affect teacher capacity and support. Providing comprehensive training, ongoing mentorship, and responsive administrative policies will not only enhance teacher competence but also ensure that students receive the quality mathematics education they deserve.

Based on the findings of this study, the following recommendations are proposed to support non-mathematics teachers in effectively implementing the mathematics intervention program:

1. Implement Targeted Professional Development Programs. The administration should provide regular and structured professional development sessions focused on both content knowledge and pedagogical strategies in mathematics. These training sessions should be designed to address the specific gaps in mathematical understanding and instructional approaches identified among non-mathematics major teachers. This can be in the form of in-service training and school learning action cells.
2. Establish Mentoring and Peer Support Systems. A formal mentoring system should be established wherein experienced mathematics teachers guide and support non-mathematics major teachers. This can include lesson planning assistance, co-teaching opportunities, and collaborative reflections. Peer support groups or communities of practice can also foster knowledge sharing and confidence building.
3. Develop and Provide Accessible Teaching Resources. The Department of Education and school administration should provide structured, easy-to-understand teaching guides, contextualized examples, and visual materials to help non-specialist teachers prepare for lessons. These resources should be aligned with the curriculum and support differentiated instruction.
4. Strengthening Instructional Supervision and Feedback. School leaders and coordinators should take an active role in monitoring the implementation of math intervention programs, offering constructive feedback, and ensuring that teachers receive the support they need. Regular classroom observations with post-conferences can help identify specific teacher needs and celebrate small successes.

5. Provide Adequate Preparation Time for Teachers. Teachers should be given sufficient time during the work week for lesson study, content review, and collaboration. This is especially critical for non-mathematics major teachers who need more time to internalize and plan mathematics lessons effectively.
6. Incorporate Diagnostic Tools and Training in Assessment. Teachers should be trained in interpreting various solution strategies and assessing student understanding beyond final answers. Diagnostic tools and rubrics should be developed to help teachers assess student work fairly and accurately, especially when students use non-traditional methods of solving problems.
7. Advocate for Policy Review and Curriculum Flexibility. The Department of Education may consider reviewing policies that assign mathematics teaching duties to non-specialists, ensuring long-term solutions such as hiring qualified math teachers or providing certifications for non-mathematics major teachers.

References

Atweh, B., Kaur, B., Nivera, G., Abadi, A., & Thinwiangthong, S. (2023). Futures for post-pandemic mathematics teacher education: Responsiveness and responsibility in the face of a crisis. *ZDM – Mathematics Education*, *55*(1), 65–77. https://doi.org/10.1007/s11858-022-01394-y

Barbadillo, N. J. J. (2021). Non-specialized teachers handling major subjects: A grounded theory. *Psychology and Education*. *58*(3): 3921 – 3933. http://psychologyandeducation.net/pae/index.php/pae/article/view/4600

Copur-Gencturk, Y., & Tolar, T. (2022). *Mathematics teaching expertise: A study of the dimensionality of content knowledge, pedagogical content knowledge, and content-specific noticing skills.* Teaching and Teacher Education, *114*, 103696. https://doi.org/10.1016/j.tate.2022.103696

Crisan, C., & Rodd, M. (2017). Learning mathematics for teaching mathematics: Non-specialist teachers' mathematics teacher identity. *Mathematics Teacher Education and Development, 19*(2), 104–122.

Department of Education. (2023). *Policy guidelines on the implementation of the MATATAG curriculum* (DepEd Order No. 10, s. 2024). https://www.deped.gov.ph

Department of Education. (2024). *Adoption of the National Learning Recovery Program in the Department of Education* (DepEd Order No. 13, s. 2023). https://www.deped.gov.ph

Department of Education. (2025). *Implementing Guidelines of the Academic Recovery and Accessible Learning (ARAL) Program* (DepEd Order No. 018, s. 2025). https://www.deped.gov.ph

Hobbs, L., & Porsch, R. (2021). *Teaching out-of-field: Challenges for teacher education*. *European Journal of Teacher Education, 44*(5), 601–610. https://doi.org/10.1080/02619768.2021.1985280

Llurag, S. M., Kilag, O. K. T., Villanueva, K. M., Samutya, M. M., Rabi, J. I. A., & Kilag, J. N. (2024). *Enhancing mathematics education in the Philippines: Addressing challenges and improving instructional quality through professional development*. *International Multidisciplinary Journal of Research for Innovation, Sustainability, and Excellence (IMJRISE), 1*(4). 190-196.

Mullins, I., Martin, M., Foy, P., Kelly, D., & Fishbein, B. (2020). *TIMSS 2019 international results in mathematics and science*. International Association for the Evaluation of Educational Achievement (IEA).

Organisation for Economic Co-operation and Development. (2023). *PISA 2022 results: Country notes—Philippines*. https://www.oecd.org/en/publications/pisa-2022-results-volume-i-and-ii-country-notes_ed6fbcc5-en/philippines_a0882a2d-en.html

Raymundo, M. S. (2021). Teaching non-major subjects: A challenge to senior high school teachers. *The URSP Research Journal*, *7*(1), 33-42.

Sani, N., & Burghes, D. (2022). Longitudinal study of 'retraining' non-maths specialist teachers to become capable, confident teachers of mathematics. *International Journal of Mathematical Education in Science and Technology*, *53*(9), 2438–2464. https://doi.org/10.1080/0020739X.2021.1890248

Second Congressional Commission on Education. (2024). *Miseducation: The failed system of Philippine education* (Year one report). https://edcom2.gov.ph/media/2024/02/EDCOM-II-Year-One-Report-PDF-022924.pdf

Villanueva, K. M., Kilag, O. K. T., Abrencia, E. C., Samutya, M. M., Bocao, M. T., & Rabi, J. I. III. A. (2024). *Charting a course for improvement: Assessing mathematics education in the Philippine context*. *International Multidisciplinary Journal of Research for Research for Innovation, Sustainability, and Excellence (IMJRISE), 1*(4), 67-74.

Yumang, J. R. (2021). *Bittersweet moments in teaching non-specialized subjects among senior high school teachers*. *European Journal of Humanities and Educational Advancements (EJHEA), 2*(8).

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