TEACHER PREPAREDNESS FOR THE NATIONAL MATHEMATICS PROGRAM IMPLEMENTATION: A MIXED METHODS STUDY

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ABSTRACT

This mixed methods study explored the preparedness of non-Mathematics major teachers in the Montevista District for the implementation of the National Mathematics Program during the School Year 2024–2025. Utilizing an explanatory sequential design, the research first collected quantitative data from 100 teachers with at least three years of teaching experience, followed by in-depth interviews with seven teachers with over ten years of experience. The study aimed to assess teacher preparedness across four domains: knowledge and awareness of the NMP, instructional preparedness, attitudes toward the program, and access to training, support, and resources. Quantitative findings indicated that while teachers were generally familiar with the NMP's goals, content, and teaching strategies, their overall confidence remained moderate. This was echoed in the qualitative data, which revealed that teachers engaged in self-initiated strategies such as simplifying lessons, collaborating with Math teachers, and applying NMP-aligned practices like group work, visual aids, and differentiated instruction. Attitudes toward the NMP were largely positive, with teachers expressing motivation to improve their practice and participate in professional development. However, both data sets highlighted common challenges related to limited training opportunities, inadequate instructional materials, and insufficient administrative support. The integration of findings underscored that although teachers demonstrated resilience and adaptability, the effectiveness of NMP implementation relies heavily on enhancing institutional support and resource allocation. The study offers valuable insights for DepEd and school administrators aiming to strengthen teacher readiness and ensure the sustainable success of mathematics education reforms.

Keyword: *mathematics teaching, teacher preparedness, National Mathematics Program, NMP, knowledge and awareness, instructional preparedness, attitudes toward the NMP, mathematics education reform, explanatory sequential mixed methods design*

1. INTRODUCTION

1.1 The Problem and Its Background

Teacher preparedness plays a vital role in the success of any curricular reform. When educators are equipped with the necessary knowledge, skills, and confidence to implement new programs, educational reforms are

more likely to succeed and create a long-term impact. The National Mathematics Program (NMP) was introduced in the Philippines to improve the quality, relevance, and consistency of mathematics instruction across all grade levels. As the individuals directly responsible for putting this program into practice, teachers must be adequately prepared to meet its demands. Evaluating teacher preparedness is therefore essential to determine whether the goals of the NMP can be achieved and to identify the types of support that teachers may still require.

Around the world, education systems have encountered difficulties when implementing changes to the mathematics curriculum, often due to differences in the level of teacher readiness. Research shows that even when new and improved standards are introduced, many teachers feel unprepared to apply them in the classroom. In the United States, for example, Cohen and Hill (2001) found that teachers faced challenges in understanding new content expectations and adopting new teaching strategies [1]. A similar situation occurred in South Africa, where curriculum reforms aimed at promoting critical thinking in mathematics were hindered by teachers' limited training and lack of content knowledge (Venkat & Spaull, 2015) [2]. These examples highlight a common issue: reforms are only as strong as the teachers who implement them.

In the Philippines, early studies have begun to explore how teachers are managing the shift to the NMP. Baquirquir et al. (2024) reported that many mathematics teachers face several challenges, such as insufficient training, a lack of teaching materials, and the pressure to meet performance-based targets [3]. His findings also revealed a noticeable gap between the expectations set by policymakers and the actual conditions in classrooms, where teachers often have to adjust on their own without adequate support.

At Montevista National High School, as well as other schools in Montevista District, these challenges are further compounded by the assignment of teachers without formal training in mathematics to handle mathematics classes. This situation raises concerns about their ability to deliver the curriculum effectively, especially in terms of content mastery and instructional confidence. The purpose of this study is to examine the level of preparedness among these teachers and to determine the specific challenges they face in implementing the NMP. The findings aim to inform school administrators and teacher training institutions about the support systems that need to be in place to ensure effective and sustainable implementation not only in Montevista but in other similar educational contexts as well.

1.2 Theoretical Lens

This study applies General Systems Theory (GST), introduced by von Bertalanffy, which views education as an interconnected system where teachers, students, curriculum, and resources work together toward common goals. Rather than treating teacher preparedness as an isolated factor, GST frames it as part of a dynamic network shaped by feedback, resources, and systemic alignment (Frik et al., 2005) [4]. Using sequential explanatory mixed-methods design, the study first measures teachers' preparedness for the NMP through surveys, then explores their experiences and challenges through interviews. By integrating both phases, the research highlights that sustained NMP success requires coherent, coordinated support across the entire educational system, positioning teachers as both products of and contributors to reform.

1.3 Statement of the Problem and Research Questions

This study aims to examine the level of teachers' preparedness for the implementation of the NMP in the schools of Montevista District. Specifically, it investigates teachers' preparedness in terms of their knowledge and awareness of the NMP, instructional preparedness, attitudes toward the program, and access to training, support, and resources. In addition, the study explores teachers' lived experiences in implementing the NMP, focusing on their challenges, coping strategies, and insights. The following qualitative research questions guide this component of the study:

1. What are the participants' experiences in implementing the National Mathematics Program in the classroom?
2. What challenges do participants encounter in implementing the National Mathematics Program?
3. How do participants cope with the challenges in implementing the program?
4. What insights can participants share from their experiences with the NMP?

2. METHODS

This chapter describes the study's research design, the participants, instruments, data collection procedures, and statistical analyses used in the quantitative and qualitative phases.

2.1 Research Design

This study adopted an explanatory sequential design within a mixed methods approach. In this design, quantitative data are collected and analyzed first, followed by qualitative data collection to further explain or elaborate on the initial quantitative findings (Creswell & Plano Clark, 2018) [5]. The two-phase structure allows the qualitative phase to be shaped by the results of the quantitative analysis, offering deeper insight into observed trends or unexpected results. This methodological integration provides a more comprehensive understanding of teacher preparedness, capturing both general trends and in-depth individual experiences of teachers.

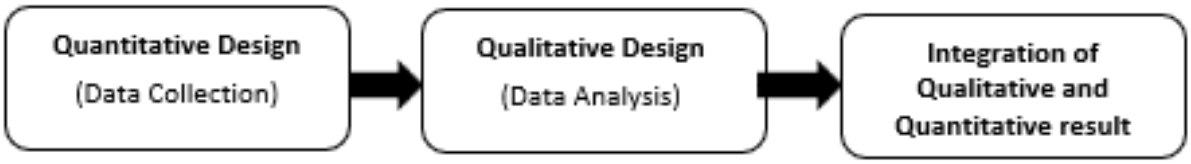

Fig-1: Research Design Diagram

2.2 Quantitative Phase

The study was conducted in public schools of the Montevista District, located in the Municipality of Montevista, Davao de Oro, Philippines. For the quantitative phase of the study, the participants were out-of-field mathematics teachers assigned to teach under the NMP in public schools within the Montevista District during the 2024–2025 school year. Eligible participants had at least three years of continuous teaching experience at the time of data collection. A universal sampling technique was employed, resulting in 100 teachers from various schools in the district consenting to participate in the study. Teachers who were assigned to other districts, did not teach mathematics under the NMP, or had fewer than three years of teaching experience were excluded from the sample. Quantitative data were collected through a validated, researcher-adapted survey consisting of 30 items across four domains: Knowledge and Awareness, Instructional Preparedness, Attitudes Toward the NMP, and Training, Support, and Resources. A four-point Likert scale was used to quantify responses for analysis. To interpret the survey results, mean scores were categorized using a descriptive rating scale. Scores from 1.00–1.49 indicated Strongly Disagree, 1.50–2.49 Disagree, 2.50–3.49 Agree, and 3.50–4.00 Strongly Agree, providing a clear framework for analyzing participants' perceptions across the four domains.

2.3 Qualitative Phase

For the qualitative phase, seven teachers with a minimum of 10 years of teaching experience from the respondents were selected through purposive sampling. This approach aimed to gain deeper insights from individuals with extensive classroom and instructional experience relevant to the study. In-depth interviews (IDIs) were conducted, using an interview guide validated by experts, with selected informants to gather qualitative insights. Thematic analysis was employed to interpret the qualitative data, which served to complement and support the quantitative findings.

3. RESULTS AND DISCUSSION

This chapter presents the results and discussion of the study examining the preparedness of teachers, specifically out-of-field Mathematics teachers, in Montevista District, Division of Davao de Oro, for the implementation of the NMP.

3.1 Results

Teacher Preparedness in Terms of Knowledge and Awareness. Table 2 presents the mean scores and descriptive ratings for teachers' knowledge and awareness of the NMP.

Table-1: Mean Test Scores of Knowledge and Awareness as a Teacher

Indicators	Mean	Descriptive Rating
1. I am familiar with the goals of the National Mathematics Program.	3.24	**Agree**
2. I understand the specific content and skills emphasized by the NMP at the level I teach.	3.19	**Agree**
3. I am aware of how the NMP integrates real-life applications of mathematics.	3.30	**Agree**
4. I understand the scope and sequence of mathematics topics under NMP.	3.12	**Agree**
5. I know how to design lessons that reflect the NMP framework.	2.99	**Agree**
6. I understand how the NMP aligns with national learning standards and assessment frameworks.	3.15	**Agree**
7. I am familiar with recent updates or changes made to the National Mathematics Program.	2.99	**Agree**
8. I understand how the NMP supports the development of critical thinking and problem-solving skills.	3.27	**Agree**
9. I know how technology is integrated into the NMP to support learning.	3.17	**Agree**
Overall mean	**3.16**	**Agree**

Table 1 revealed a moderate level of teacher preparedness in terms of knowledge and awareness, with an overall mean of 3.16. Teachers reported the highest awareness in integrating real-life applications of mathematics (M = 3.30) and familiarity with the program's goals (M = 3.24). The lowest scores were for designing lessons aligned with the NMP framework (M = 2.99) and awareness of recent updates (M = 2.99).

Qualitative findings provided in depth for these results. Teachers described the implementation as challenging at first, especially for non-math majors, noting the need to self-study unfamiliar content:

> "It was a bit challenging at first since Math is not my main subject. I had to study again to have something to teach." (P01)

Others expressed limited initial orientation:

> "It would have been better if we were informed beforehand about what should be given to the students. We were just shocked when we were suddenly given NMP teaching load" (P03)

Still, teachers recognized the purpose of strengthening students' mathematical skills and viewed the program as a positive opportunity to address learning gaps. These perspectives help explain why overall awareness is "Agree" but not high. Many teachers are still in the process of building program-specific knowledge through practice rather than formal training.

Instructional Preparedness as a Teacher. Table 2 summarizes the respondents' self-assessed instructional preparedness about the implementation of the NMP.

Table-2: Mean Test Scores of Instructional Preparedness as a Teacher

Indicators	Mean	Descriptive Rating
1. I am confident in designing math lessons that reflect the NMP's priorities.	3.00	**Agree**
2. I regularly use teaching strategies promoted by the NMP, such as inquiry-based or problem-centered instruction.	3.13	**Agree**

3.	I incorporate real-life contexts and mathematical modeling as suggested by the NMP.	3.20	**Agree**
4.	I can effectively use formative and summative assessments aligned with NMP objectives.	3.21	**Agree**
5.	I adapt my instructions to meet the needs of diverse learners in line with NMP strategies.	3.22	**Agree**
6.	I use collaborative learning activities to enhance student understanding.	3.26	**Agree**
7.	I integrate formative feedback regularly to improve student learning.	3.23	**Agree**
8.	I modify my lesson plans based on student assessment results to better meet learning goals.	3.23	**Agree**
9.	I use technology tools effectively to support my mathematics instruction.	3.17	**Agree**
Overall mean		**3.18**	**Agree**

Table 2 indicated an overall mean of 3.18, suggesting general readiness to implement NMP-related instructional strategies. Highest ratings were in collaborative learning (M = 3.26) and integrating formative feedback (M = 3.23). The lowest was designing NMP-aligned lessons (M = 3.00), consistent with gaps identified in knowledge and awareness.

Qualitative responses revealed varied strategies in practice, including short drills, real-life examples, collaborative group work, and worksheets, all of which align with NMP's emphasis on active learning. Some teachers emphasized starting from basic operations to rebuild foundational skills:

> "Back to basic because we have to strengthen their foundations on the basic math operations" (P03).

Others integrated hands-on activities and recitation to encourage participation:

> "Recitation of multiplication table first. Mastery in one topic before proceeding to the next" (P05)

However, several teachers admitted needing to adjust teaching styles and become more learner-centered, which aligns with the moderate readiness scores:

> "I realized I need to adjust my teaching style. I need to be more patient and creative" (P01)

Attitudes towards NMP as a Teacher. Table 3 presents the result of teacher preparedness in terms of attitudes towards NMP.

Table-3: Mean Test Scores of Attitudes towards NMP as a Teacher

Indicators		**Mean**	**Descriptive Rating**
1.	I believe the NMP will improve students' mathematical understanding and performance.	3.50	**Agree**
2.	I am motivated to align my teaching with the expectations of the NMP.	3.36	**Agree**
3.	I view the NMP as a positive development in national education.	3.36	**Agree**
4.	I am willing to make changes in my teaching practice to support the success of the NMP.	3.37	**Agree**
5.	I feel that following the NMP will make teaching mathematics more enjoyable and meaningful.	3.38	**Agree**
6.	I am open to professional learning opportunities related to NMP.	3.46	**Agree**
Overall mean		**3.41**	**Agree**

This domain received the highest quantitative mean (3.41), indicating strong teacher motivation and belief in the program's benefits. The most agreed-upon item was that NMP will improve students' mathematical performance (M = 3.50).

Qualitative narratives confirmed these positive dispositions. Teachers valued seeing students become more confident, helping each other, and improving problem-solving skills:

> "The eagerness of the students to learn the lessons was truly the number one reason why I enjoyed teaching under the NMP." (P05)

Some participants also reflected on how the experience reshaped their view of mathematics, moving from reluctance to appreciation:

> "I hate teaching math, but these experiences have taught me to trust the process and there is joy in solving problems" (P05).

These insights illustrate how positive attitudes are reinforced by tangible improvements in student engagement and skills, creating a feedback loop that sustains teacher commitment.

Training, Support, and Resources. Table 4 presents the result of the teachers' level of preparedness in terms of training, support, and resources related to the implementation of the NMP.

Table-4: Mean Test Scores of Trainings, Support, and Resources

Indicators	Mean	Descriptive Rating
1. I have access to quality teaching materials that support the NMP.	2.87	**Agree**
2. I have received adequate training related to the NMP implementation.	2.57	**Agree**
3. I have opportunities to collaborate with fellow mathematics teachers regarding the NMP.	2.99	**Agree**
4. I feel supported by my school administration in implementing the NMP.	3.17	**Agree**
5. I receive timely updates and clear communication about the NMP implementation.	2.96	**Agree**
6. Professional development opportunities related to the NMP are relevant and practical to my teaching needs.	3.17	**Agree**
Overall mean	**2.96**	**Agree**

Quantitatively, this domain had the lowest overall mean (2.96), with adequacy of training (M = 2.57) and access to quality materials (M = 2.87) emerging as the weakest areas.

Qualitative findings strongly supported these numbers. Teachers frequently cited a lack of updated and appropriate materials, insufficient training, and heavy reliance on personal resourcefulness:

> "It would really be better if the administration gave more support. But as teachers, we must still do our duty. We just have to be resourceful and make do with what we have." (P03).

> "I believe that non-Math teachers can play a valuable role in implementing the program provided that the administration will offer opportunities for training to enhance knowledge and skills" (P06).

Administrative support was described as helpful when present but inconsistent. While some felt encouraged and supplied with materials, others had to create their own activity sheets or depend on math teachers' resources. Teachers also stressed the need for localized materials and better scheduling to improve implementation.

3.2 Discussion

This study examined the preparedness of teachers in the Montevista District to implement the NMP through an explanatory sequential mixed-methods design. Quantitative results revealed generally positive ratings across knowledge and awareness, instructional preparedness, and attitudes toward the NMP, with lower ratings in training, resources, and lesson design. Qualitative findings provided depth to these results, highlighting challenges such as limited training, lack of instructional materials, misalignment between teacher expertise and program demands, and time constraints.

Knowledge and Awareness. Teachers demonstrated a solid understanding of the NMP's emphasis on real-life application of mathematics, consistent with the program's learner-centered philosophy (Darling-Hammond et al., 2017) [6]. However, both survey and interview data revealed gaps in applying this knowledge to lesson design, particularly among non-mathematics majors. Similar findings have been reported by Lopez and Roble (2022), who noted that out-of-field teachers often struggle to translate conceptual awareness into practice due to insufficient training [7]. These gaps underscore the importance of timely curriculum updates, clear orientation, and targeted professional development.

Instructional Preparedness. Participants expressed confidence in using collaborative and learner-centered approaches, supported by formative assessment and feedback-based instruction, aligning with reflective teaching principles (Larrivee, 2008) [8]. However, low confidence in designing NMP-aligned lessons again surfaced as a persistent challenge. Luft et al. (2011) emphasize that content mastery is essential for curriculum fidelity, suggesting that scaffolded lesson models and peer coaching could help bridge this gap [9]. The qualitative accounts confirmed that teachers improvised effectively, using drills, group work, and real-life examples. These strategies varied in sophistication and alignment with NMP goals.

Attitudes Toward the NMP. Findings indicate high affective readiness, with teachers expressing belief in the program's potential to improve student performance and openness to change. This emotional investment mirrors Hargreaves and Fullan's (2012) view that teacher motivation is a critical driver of educational reform [10]. However, consistent with Gu and Day (2007), the study shows that motivation alone cannot overcome structural barriers such as inadequate resources or misaligned scheduling [11].

Training, Support, and Resources. Both phases of the study identified this domain as the most significant barrier to effective implementation. Teachers reported insufficient training, limited access to culturally relevant teaching materials, and inconsistent program communication issues also observed in rural Philippine contexts by Lukman and Omar (2023) [12]. The lack of manipulatives, digital tools, and localized worksheets directly impacted learner engagement and comprehension, echoing Darling-Hammond et al.'s (2017) assertion that resource quality is fundamental to teaching effectiveness [6].

4. CONCLUSION AND RECOMMENDATION

This chapter presents the conclusions, convergence of data, and recommendations drawn from the findings of the study on teacher preparedness for the implementation of the NMP in the Montevista District.

4.1 Conclusion

This explanatory sequential mixed methods study investigated the preparedness of non-mathematics major teachers in Montevista District, Division of Davao de Oro, for implementing the National Mathematics Program (NMP). Quantitative results indicated that teachers generally demonstrated moderate knowledge and awareness (M = 3.16) and instructional preparedness (M = 3.18), alongside a positive attitude toward the program (M = 3.41). However, training, support, and resources received the lowest rating (M = 2.96), revealing gaps in professional development and instructional material provision. These findings are consistent with Hine (2015), who noted that inadequate training and limited resource access hinder effective curriculum implementation, particularly for out-of-field teachers [17].

Qualitative data highlighted teachers' initial struggles with insufficient orientation, lack of specialized content knowledge, and scarcity of teaching resources. Nonetheless, many adopted adaptive strategies, such as collaborative lesson planning, differentiated instruction, and integration of real-life applications, reflecting the resilience and professional agency emphasized by Day and Gu (2014) and Kennedy (2016) [13][14]. Teachers reported noticeable improvements in student engagement, foundational skills, and problem-solving abilities, aligning with Bandura's self-efficacy theory, which underscores the role of mastery experiences in fostering confidence and persistence [15].

Overall, while teacher motivation and openness to innovation were strong, sustainable implementation of the NMP will require systemic support, targeted capacity building, and equitable resource distribution to bridge the gap between policy expectations and classroom realities (Fullan, 2007) [16].

4.2 Convergence of Data

The integration of quantitative and qualitative findings presents a cohesive understanding of teachers' experiences in implementing the NMP. Quantitative results indicate that teachers are generally familiar with the program's goals, content, and recommended strategies, though their confidence levels remain moderate. This aligns with qualitative accounts describing practices such as reviewing instructional materials in advance, simplifying lesson content, and seeking support from mathematics-specialized colleagues to address content gaps.

Across both data sets, teachers consistently reported employing NMP-aligned strategies, such as collaborative group work, use of visual aids, and differentiated instruction, which all reflected the moderate quantitative ratings in these domains. Attitudinally, teachers demonstrated optimism toward the NMP and a willingness to adapt, which was reinforced qualitatively by reflections on increased flexibility, learner-centered teaching, and professional growth.

Despite this alignment, both strands of data reveal persistent systemic barriers. The most notable challenges include insufficient formal training, limited access to developmentally appropriate instructional materials, and inconsistent administrative support. Teachers' calls for targeted professional development, provision of localized resources, and stronger leadership engagement suggest that while individual commitment and adaptability are strong, sustainable and effective NMP implementation will require substantial institutional investment.

4.3 Recommendation

Based on the findings, the following recommendations are proposed:

For the Department of Education: Develop a comprehensive, multi-phase training plan for NMP implementation, prioritizing non-mathematics teachers; Allocate sufficient funding for localized and culturally relevant teaching materials; and integrate teacher feedback into program revisions.

For School Leaders: Establish peer mentoring systems between mathematics and non-mathematics teachers; Review and adjust NMP schedules to optimize learning time; and provide consistent emotional and logistical support to teachers

For Teachers: Engage in collaborative planning and peer observations to enhance instructional strategies; Adopt differentiated instruction and hands-on activities to address diverse learner needs; and maintain reflective practice to adapt and improve instruction over time.

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