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Lived Experiences of Teachers in the Implementation of the National Mathematics Program in the Philippines

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Abstract
This qualitative phenomenological study explored the lived experiences of seven public school teachers in the Philippines during the implementation of the National Mathematics Program (NMP). Grounded in educational reform theories and curriculum implementation models, the study explored how teachers in Cebu City and the Province experienced the implementation of the National Mathematics Program (NMP). Data were collected through in-depth interviews and analyzed using thematic analysis to identify recurring patterns and key themes. Researchers identified significant challenges, including a lack of subject-specific expertise, inadequate resources, and limited support. These challenges hindered teachers' ability to align classroom instruction with NMP standards. The study emphasized the crucial need for targeted professional development to enhance teachers' understanding and application of NMP concepts. Furthermore, providing teachers with the necessary resources and institutional support is essential for successful program adaptation. Ultimately, the study underscores that addressing these challenges is critical for improving student learning outcomes and ensuring the success of educational reforms like the NMP.

Keywords: DepEd, mathematics education, National Mathematics Program, Philippines, professional development, Teaching strategies

Introduction

The Philippine government has launched the National Learning Recovery Program (NLRP) to help students catch up on essential learning competencies. A key part of this effort is the National Mathematics Program (NMP), which aims to significantly enhance math education in public schools across the country. As stated in the study by Mark and Vogeli (2018) [13] basing the goals of the national and international mathematics assessments in which Filipino students and pre-service teachers have participated, the results show that the country's mathematics education has to be strengthened. This only emphasizes that despite the aspirations of the K-12 Curriculum, mathematics education in the Philippines faces numerous challenges showing a significant gap in understanding mathematics among learners on how they failed to meet the required level of proficiency (Lituanas *et al*., 2001; Sánchez-Cabrero *et al*., 2021). This study aims to understand the lived experiences of public school teachers in the implementation of the National Mathematics Program in the Philippines.

The educational initiative in implementing the National Learning Recovery Program (NLRP) aims to recover and accelerate the key learning of the learners by providing remedial instructions including mathematics, addressing the learning losses and disruptions caused by the COVID-19 pandemic. Under this initiative, there were varied programs that aimed to highlight the specific learning areas and one of these initiatives is the implementation of the National Mathematics Program aiming to address the challenges such as low student performance in mathematics in the Philippines and seeking to adopt more effective approaches and teaching strategies that correlates to the international standards to ensure that the Filipino students are globally competent. Kunwar (2020) [10] claimed that one of the significant factors contributing to students' anxiety in mathematics arises from their negative perspective of the subject based on the Inquiry report (2024) The Programme for International Students Assessment 2022 (PISA 2022), the Philippines ranked sixth from the bottom in the mathematics field. This leads to implementing this

initiative as a response to the persistent concerns about the country's global educational standing in which the Teachers' professional development (PD) programs are critical in addressing mathematics challenges and improving the quality of mathematics instruction (Chan & Chen, 2022; Sancar *et al*., 2021) [6]. While varied studies have explored the outcomes and student performance within the Mathematics performance of the students, there is a notable research gap in examining teachers' lived experiences during its implementation. Existing studies often emphasize the learning content and students' perspectives. Still, it tends to overlook the crucial insights of educators who are directly responsible for delivering this program in classrooms. This gap leaves a significant aspect of program effectiveness underexplored, particularly how teachers adapt and respond to policy changes, and how these experiences influence both teaching practices and student success.

The stakeholders will benefit from the study's findings about the National Mathematics Program's implementation in the Philippines for the students to have a better knowledge of what the program has to offer, which might boost their interest and result in improved educational outcomes. It will be simpler for teachers to present information effectively when successful instruction strategies and areas in need of improvement are recognized. With an in-depth comprehension of the program's objectives, parents and guardians will be more able to participate more actively in the educational experience of their kids and set reasonable standards. With the study providing a thorough assessment of the program's efficacy, policymakers will be able to make well-informed revisions. The research results will also be beneficial to future researchers as a foundation for investigating similar topics, pointing out areas needing further study, and evaluating the implementation's strengths and weaknesses. The study aims to provide students with a better knowledge of what the program has to offer, which may pique their interest and lead to improved educational outcomes.

Methodology

Research Design

This study used a qualitative phenomenological approach to explore how teachers perceive and experience the National Mathematics Program implementation in Philippine public schools. This approach focuses on understanding teachers' perceptions and experiences to provide detailed insights into how the program is being carried out, gaining a deep understanding of their perceptions and interpretations of the program's practical application, effectiveness, and impact on their teaching practices. Byrne (2001) [3] stated that "Qualitative research examines life experiences (ie, the lived experience) to understand and give them meaning. This usually is done by systematically collecting and analyzing narrative materials using methods that ensure the credibility of both the data and the results."

Sampling Design, Respondents, and Environment

This study used a purposive sampling method, a type of non-probability sampling, targeting a range of public schools in Cebu, Philippines both in the province and city, with seven teachers serving as respondents or when data saturation is met. According to Campbell *et al*. (2010) [4], the reason for purposive sampling is the better matching of the sample to the aims and objectives of the research, thus improving the rigor of the study and the trustworthiness of the data and results. According to Palinkas *et al*. (2015) [15], it is a way of identifying and selecting cases that will effectively use limited research resources. In other words, units are chosen "on purpose" in purposive sampling. In this example, researchers carefully picked bachelor of primary education teachers who had participated in the Philippines' National Mathematics Program.

Research Instrument

Researchers themselves used a questionnaire to conduct interviews with the respondents. Semi-structured questionnaires were employed in this interview. According to Gill *et al*. (2008), Semi-structured interviews consist of several key questions that help to define the areas to be explored, but also allow the interviewer or interviewee to diverge to pursue an idea or response in more detail". This questionnaire features an open-ended question where teachers can describe their experiences with the National Mathematics Program. Furthermore, additional responses will be recorded using an audio recorder to give and collect as much relevant and reliable information as feasible.

Data Gathering Procedure

After thoroughly explaining the interview process, the researchers secured informed consent from all participants. The interviews were conducted face-to-face and audio-recorded for accurate transcription. Each interview lasted between three to ten minutes. Data collection took place during the first semester of the 2024-2025 academic year, allowing for flexibility to accommodate participants' preferences and schedules.

All sessions were audio-recorded to ensure a comprehensive record of the discussions. Each participant underwent multiple semi-structured interviews to enhance the rigor of this qualitative research. The study also employed person triangulation, involving in-depth interviews while observing participants' actions, mannerisms, and gestures to bolster the study's credibility. A coding system was implemented to ensure participant anonymity and confidentiality, identifying them as Respondent 1. As a form of compensation, participants received tokens.

Data Analysis

Thematic analysis was primarily defined as "a method for identifying, analyzing, and reporting themes within data" that allowed for a comprehensive understanding of qualitative data (Colaizzi, 1978 as cited by Baquirquir, 2024) [19]. Colaizzi's seven-step method was employed in the study procedure. This method included: (1) familiarizing oneself with the data by reading and re-reading all transcripts to gain a general sense of the participants' experiences; (2) extracting significant statements that directly related to the phenomenon under study; (3) formulating meanings from these significant statements to interpret their underlying essence; (4) organizing the formulated meanings into clusters of themes that reflected the core aspects of the phenomenon; (5) developing an exhaustive description that integrated all the themes into a comprehensive overview; (6) describing the fundamental structure of the phenomenon by synthesizing the exhaustive description into a coherent narrative; and (7) validating the findings by returning them to the participants to ensure their experiences were accurately represented.

Ethical Considerations

In this research study, several ethical factors will be considered in accordance with the ethical guidelines set by the Ethics Review Committee of Cebu Normal University. This study presents no potential conflict of interest between the researchers and the participants, as their participation in the study will not impact their employment or professional standing. To ensure privacy and confidentiality, all the data that will be collected will be solely for the researcher's access and will be used only for the study. The researchers will also seek permission from the participants by providing them with a written consent form before the interview. They will also be informed that their participation is voluntary and that they are allowed to withdraw from the study at any time without facing any consequences. The study will only focus on gathering data related to the implementation of the National Mathematics program in the Philippine Public Schools. Therefore, there are no known risks subjected to the participants. Lastly, to express sincere appreciation for the participants' time and valuable insights, the researchers provided each participant with a small token of gratitude after the interview, such as a gift or incentive.

Results and Discussion

A total of eleven (11) significant statements were extracted from the interview transcripts, leading to the development of 22 codes. These codes were grouped into five categories, emerging as four key themes. According to participants, implementing the National Mathematics Program in Philippine public schools involved multiple strategies and adjustments. Educators reported both successes and challenges, such as limited resources and insufficient training. Nevertheless, they continued to seek innovative solutions and support systems to improve program delivery. Positive impacts were noted, especially in increased student interest and collaboration among educators, underscoring how committed efforts toward program implementation were instrumental in enhancing students' foundational skills and overall engagement in mathematics.

Theme 1: Impact of NMP on Learning Outcomes

The National Mathematics Program (NMP) serves as a transformative tool in improving the learning outcomes of the students as the teachers highlighted the efficiency in addressing such pressing issues of mathematics in Cebu City. The implementation of the National Mathematics Program does not allow the teachers to gradually enhance the students' performance in mathematics but also a way to discover different ways of teaching mathematics in a much easier and more engaging way. This commonality emerged as a significant finding of the study, highlighting the program's impact on student learning outcomes. The National Mathematics Program (NMP) plays a vital role in enhancing students' learning outcomes and understanding of mathematics by providing structured teaching approaches and diverse activities, which support skill development, critical thinking, and practical application. These are supported by the responses of the following:

"Math is a very difficult subject for the pupils to learn, so I am thankful there's NMP. It really helps because it gives us different ways to teach learners Math." - Teacher Keira

"Adding the implementation of the NMP to our subject in the MATATAG Curriculum really helps because it gives us more time to teach mathematics, which improves students' numeracy and allows us to provide them with various techniques and activities…" - Teacher Merliah

"The National Mathematics Program is very useful for the learners because it encourages them to develop critical thinking through the learning activities we give…" - Teacher Odette

Teachers Merliah, Odette, and Keira loved how the National Mathematics Program (NMP) program transformed their math classes. The extra teaching time provided by the program has a positive impact on teachers like Merliah, Odette, and Keira. It gives them the chance to have engaging discussions with their students and share innovative teaching methods. The extra time that the NMP gives a deeper dive into math concepts, leads to a much better understanding for students. Research, like the work of Simon *et al*. (2016) [19], confirms that more time in the classroom can significantly improve student learning. The NMP is crucial for addressing gaps in students' math knowledge, especially in the wake of the pandemic. By focusing on foundational skills, the program can help students build a strong base in mathematics. However, the NMP also presents challenges. The increased time demands can be demanding for teachers, and they may face constraints in their classrooms. Continued support and resources are essential to help teachers effectively implement the program while keeping students engaged and motivated.

Theme 2: Challenges in Teaching Mathematics

The teaching of mathematics presents varied challenges, particularly in addressing the diverse learning needs of students, such as low comprehension skills, learning gaps in foundational knowledge, and different learning paces. These factors hinder students' ability to engage in math. These challenges stem from the inherent complexity of mathematics itself, the diverse learning paces and needs within classrooms, and the compounding impact of pandemic-related disruptions to education. While initiatives such as the National Mathematics Program offer valuable support resources, their implementation can demand substantial time and necessitate significant adaptations to existing teaching practices. This underscores the multifaceted nature of the challenges faced by educators in fostering a deeper understanding of mathematics among all students. These are supported by the responses of the following:

> "...we have to give time to the students because some are good and some are a bit of a slow learner. To assist students who learn at a slower pace, we implement regular drills and review sessions to facilitate their progress and enable them to keep up with their peers." - Teacher Ken
>
> "... some students struggle due to low comprehension and lack of a solid foundation in numbers, especially after experiencing the pandemic, which affected their learning. This makes it difficult for them to develop an interest in math." - Teacher Blair

Furthermore, a significant challenge arises from instructional constraints, which encompass limitations faced by teachers in effectively delivering instruction. These constraints include factors such as limited time, inadequate resources, and rigid instructional guidelines. These limitations hinder teachers' ability to effectively address the diverse learning needs of each student, particularly when students exhibit foundational learning gaps.

> Teacher Erika shared that "...with fundamental mathematical concepts, which is beneficial but time-intensive.". Similarly, Teacher Tori conveyed that "from the usual 1 hour to 50 mins in our math subject, it seems that it was given an additional 30 mins as supplementary because of the program"

The experiences of the teachers in this study show a range of difficulties and approaches to meeting the learning requirements of math-challenged pupils. As Teacher Ken points out, they say that helping slow learners takes more time and work and frequently entails drills and reviews to reinforce fundamental abilities. Additionally, Teacher Blair emphasized the pandemic's effects, which have left many kids with a lack of interest in arithmetic and substantial comprehension gaps because of a poor foundation in fundamental number concepts. Listiawati *et al*. (2023) [11] confirmed that there is a much-needed focus on slow learners-specific interventions. Teachers must balance program guidelines with tailored support to accommodate varying comprehension levels and learning gaps made worse by the pandemic. This highlights the need for both structured program support and flexible teaching strategies that can address the needs of individual learners. Moreover, Adawiah, R. (2023) [1] confirmed through her statement from the study that teachers often struggle with the implementation of comprehensive assessments due to time limitations and insufficient resources, which affects the quality of student evaluations. Instructional constraints limit the flexibility of teachers and prevent teachers from adapting their instruction to meet diverse student needs. These constraints make it difficult for teachers to foster comprehensive understanding and development in students, especially those who require additional support. It is implied that targeted programs like the National Mathematics Program which provided more flexible teaching time and resources can significantly improve educators' ability to support diverse student needs, student learning outcomes, and teacher effectiveness. It is also suggested that educational programs like the NMP should continue to be expanded to give teachers the necessary tools and time to address students' foundational gaps, particularly in the aftermath of the pandemic more effectively.

Theme 3: Supportive Interventions and Strategies

Addressing the diverse needs of the students in learning mathematics requires an implementation of supportive interventions and adaptive teaching strategies which gives the teachers an emphasis on the importance of practices such as regular drills, review sessions, and differentiated instruction. This caters to varied learning paces and abilities which helps in ensuring that those students who require additional learning support receive the additional guidance they need, while those who are more advanced are challenged accordingly. Programs like the National Mathematics Program (NMP) further enhance these efforts by providing targeted support to students struggling with foundational mathematical concepts, fostering an inclusive and effective learning environment. The following teacher testimonies illustrate the effectiveness of these strategies in enhancing student learning:

"To assist students who learn at a slower pace, we implement regular drills and review sessions to facilitate their progress and enable them to keep up with their peers." - Teacher Ken

"Differentiated instruction helps teachers tailor learning by identifying students who need extra support and those who are ready for more challenging work." -Teacher Odette

> "The NMP offers targeted support for students who are having difficulty with fundamental mathematical concepts…" - Teacher Erika

Teachers Ken, Odette, and Erika all agree that helping students learn requires a flexible approach. Teacher Ken finds that extra practice and review sessions are key for students who need more time. Teacher Odette believes in tailoring lessons to each student's pace, whether they need extra support or are ready for a challenge. Teacher Erika emphasizes the importance of programs like the NMP to help students struggling with the basics. These teachers show how important it is to create a supportive classroom where every student feels valued and has the chance to succeed. Research by Thoman *et al*. (2021) [20] supports these findings, emphasizing the importance of providing temporary support to students as they learn new skills. This includes breaking down complex tasks into smaller, more manageable steps and gradually reducing support as students become more independent. By implementing these strategies, educators can effectively address diverse learning needs, fostering an inclusive classroom where all students can thrive. This approach not only improves student engagement but also enhances academic performance, particularly in foundational subjects. It is also suggested that educational programs like the NMP should continue to be integrated and expanded, providing teachers with effective tools to address learning gaps and improve outcomes for all students.

Theme 4: Teacher Adaptability and Resourcefulness

Efficiency in teaching mathematics requires educators to be adaptable and resourceful in addressing students' diverse needs and encompassing learning barriers. Educators often design and implement reviews, activities, and targeted interventions to strengthen students' proficiency and address their areas of weakness. Programs like the National Mathematics Program (NMP) enhance the fundamental support for learners struggling with fundamental concepts of mathematics, they also demand significant time and effort from teachers. These challenges highlight the importance of teachers' creativity and commitment to ensuring that all students have the opportunity to succeed in mathematics. The following educators' remarks confirmed this:

> "We're conducting reviews and activities to improve their proficiency with math but not most of them can handle it. We are doing our best to provide them with activities that will help them improve in their areas of weakness." - Teacher Ken
>
> "The NMP offers targeted support for students who are having difficulty with fundamental mathematical concepts, which is beneficial but time-intensive." - Teacher Erika

The experiences of Teacher Ken and Teacher Erika illustrate the dedication of educators to address the foundational math challenges faced by some students. They employ strategies such as focused reviews and tailored activities. This highlights both the positive impact and the demanding nature of programs like the National Mathematics Program (NMP),

which aims to improve numeracy skills. Melissa *et al*. (2020) confirmed that the dynamic nature of effective teaching requires continuous adaptation to meet the unique needs of each student. This is particularly crucial in remedial programs, where personalized support is essential but can also present significant challenges for educators. To ensure the success of programs like the NMP, it is crucial to provide teachers with the necessary support and flexibility to adapt their instruction effectively. This includes equipping them with the resources and training needed to continuously adjust their approach and address the diverse learning needs of all students.

The study revealed a significant impact of the National Mathematics Program (NMP) on student learning outcomes. Teachers consistently praised the program's structured approach, diverse activities, and increased instructional time, leading to improved skill development, critical thinking, and practical application. Teachers such as Keira, Merliah, and Odette expressed appreciation for the NMP's ability to enhance their teaching methods and create more engaging learning experiences. This aligns with existing research, such as Simon *et al*. (2016) [19], which demonstrates the positive correlation between increased instructional time and improved student learning. While the NMP offers valuable support, challenges such as increased teacher workload and potential classroom constraints require ongoing support and resources for effective implementation.

Educators identified several key challenges in teaching mathematics, including the inherent complexity of the subject, diverse student learning needs, and the ongoing impact of the pandemic. Teachers like Ken and Blair highlighted the difficulties faced by students with learning gaps and low comprehension, particularly following pandemic-related disruptions. Furthermore, instructional constraints such as limited time, inadequate resources, and rigid guidelines were identified as significant obstacles. These findings align with research by Listiawati *et al*. (2023) [11] and Adawiah, R. (2023) [1], which emphasize the need for targeted interventions and support for struggling learners. The study highlights the importance of flexible teaching strategies, tailored support for diverse student needs, and the provision of adequate resources to address these challenges effectively. Programs like the NMP, by offering increased instructional time and a focus on foundational skills, can significantly improve educators' ability to support diverse student needs and enhance overall learning outcomes.

Conclusion and Recommendations

The implementation of the National Mathematics Program in Philippine public schools presents a complex landscape of challenges and successes. While educators navigate resource constraints, inadequate training, and demanding workloads, they demonstrate resilience and adaptability in their teaching practices. This often translates into increased student engagement and improved mathematical skills. To further optimize the program's effectiveness, several key recommendations emerge. These include providing regular teacher training, ensuring adequate and equitable resource allocation, fostering collaboration among educators, administrators, and local government units, and implementing support systems for teachers, such as mentorship and stress management programs. Conducting ongoing monitoring and evaluation is essential to refine the program and achieve better student outcomes. By addressing these recommendations, the National Mathematics Program can be further strengthened, ultimately leading to improved mathematics learning outcomes for all students in the Philippine public school system.

References

1. Adawiah R. Teacher's constraints and challenges in implementing student attitude assessment in junior high school. Open Education Studies. 2023;5(1):20220204. https://doi.org/10.1515/edu-2022-0204
2. Aguhayon H, *et al*. Addressing students' learning gaps in mathematics through differentiated instruction. International Journal of Educational Management and Development Studies. c2023. https://philarchive.org/archive/AGUASL-2
3. Byrne MM. Understanding life experiences through a phenomenological approach to research. AORN Journal. 2001;73(4):700-706. https://link.gale.com/apps/doc/A73308177
4. Campbell S, *et al*. Purposive sampling: complex or simple? Research case examples. c2010. https://journals.sagepub.com/doi/abs/10.1177/1744987120927206
5. Capuyan D, *et al*. Mathematics remedial program for elementary learners in Cebu City, Philippines. American Research Journal of Humanities Social Sciences. 2019. https://www.arjhss.com/wp-content/uploads/2019/05/D251623.pdf
6. Chan & Chen, 2022; Sancar *et al*., 2021 as cited by Dicdiquin, *et al*. Evaluating the effectiveness of professional development programs for junior high school mathematics teachers in improving mathematics instruction in the K to 12 curriculum in the Philippines. International Journal of Multidisciplinary: Applied Business and Education Research. 2023;4:1143-153. https://doi.org/10.11594/ijmaber.04.04.12
7. De Vries J, *et al*. Adapting teaching to students' needs: What does it require from teachers? In: Advances in Educational Technologies and Instructional Design. Springer; 2023. p. 33. https://doi.org/10.1007/978-3-031-31678-4_33
8. Drisko JW. Transferability and generalization in qualitative research. Research on Social Work Practice. 2024. https://typeset.io/papers/transferability-and-generalization-in-qualitative-research-2buj7krgcm
9. Kr P. Application of Colaizzi's method of data analysis in phenomenological research. 2022. https://www.researchgate.net/publication/363573402
10. Kunwar R. Mathematics phobia: Causes, symptoms and ways to overcome. 2020. https://www.semanticscholar.org/paper/
11. Listiawati N, *et al*. Analysis of implementing Realistic Mathematics Education principles to enhance mathematics competence of slow learner students. Journal of Mathematics Education. 2023;14(4):683-700. https://doi.org/10.22342/jme.v14i4.pp683-700
12. Llurag S, *et al*. 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). 2024. https://risejournals.org/index.php/imjrise/article/view/399

13. Mark & Vogeli, 2018 as cited by Bernardo A, *et al*. Contrasting profiles of low-performing mathematics students in public and private schools in the Philippines: insights from machine learning. Journal of Intelligence. 2022;10(3):61. https://www.mdpi.com/2079-3200/10/3/61
14. Melissa *et al*. Challenging scripted curricula with adaptive teaching. Educational Researcher. 2021;51. https://doi.org/10.3102/0013189X211065752
15. Palinkas LA, *et al*. Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. 2015. https://pubmed.ncbi.nlm.nih.gov/24193818/
16. Sampson K, Brogt E, Comer K. Guidelines for teaching in time-shortened, intensive, or summer school settings. University of Canterbury. 2011. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=2a0deb59ecbb8a93f7738c41a16665fc1fb18621
17. Schwandt TA. The SAGE dictionary of qualitative inquiry. SAGE Publications, Inc.; 2007. https://doi.org/10.4135/9781412986281
18. Shenton AK. Strategies for ensuring trustworthiness in qualitative research projects. ResearchGate. 2016. https://www.researchgate.net/publication/22878239
19. Simon SC, *et al*. Increasing instruction time in school does increase learning. Proceedings of the National Academy of Sciences. 2016;113(27):7986-7991. https://doi.org/10.1073/pnas.1516686113
20. Thoman DB, Yap MJ, Herrera FA, Smith JL. Diversity interventions in the classroom: From resistance to action. CBE—Life Sciences Education. 2021;20(4):43. https://doi.org/10.1187/cbe.20-07-0143
21. Valle L. Reimagining mathematics education: Identifying training needs and challenges among public elementary school teachers post-pandemic. 2024. https://philpapers.org/rec/VALRME
22. Van Geel M, *et al*. Adapting teaching to students' needs: What does it require from teachers? In: Advances in Educational Technologies and Instructional Design. Springer; 2023. p. 33. https://doi.org/10.1007/978-3-031-31678-4_33
23. Villanueva K, *et al*. Charting a course for improvement: Assessing mathematics education in the Philippine context. International Multidisciplinary Journal of Research for Innovation, Sustainability, and Excellence (IMJRISE). 2024. https://risejournals.org/index.php/imjrise/article/view/256/249
24. Trochim WM. Qualitative validity. Research Methods Knowledge Base. https://conjointly.com/kb/qualitative-validity/