INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY: APPLIED BUSINESS AND EDUCATION RESEARCH
2025, Vol. 6, No. 6, 3175 – 3183
http://dx.doi.org/10.11594/ijmaber.06.06.38

Research Article

Challenges and Coping Strategies of Non-Education Graduate Mathematics Teachers in Senior High School: A Phenomenological Approach

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Article history:
Submission 24 March 2025
Revised 31 May 2025
Accepted 23 June 2025

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ABSTRACT

This study explores the challenges and coping strategies of non-education graduate Mathematics teachers in senior high school, an area that has received limited attention. Using a phenomenological research design, the study examined the experiences of ten non-education graduate Mathematics teachers from a senior high school in the Philippines. Data were gathered through semi-structured interviews and analyzed thematically. The findings revealed challenges in classroom management, selecting appropriate teaching strategies, subject knowledge, and perceived stigma. Teachers employed strategies such as peer support, professional development, resourcefulness, and a strong passion for teaching to address these challenges. To strengthen the pedagogical capacity of non-education graduate Mathematics teachers, institutions must offer targeted professional development, structured mentorship, and classroom management support, alongside opportunities for advanced studies and formal recognition to foster sustained growth and effectiveness.

Keywords: *Non-education graduate Mathematics teachers, Challenges, Coping strategies*

Background

An important consideration in developing high-caliber graduates is the quality of instruction. One problem does exist, though, and that is the requirement for further teaching preparation for non-education graduate teachers. According to Somosot et al. (2023), it was found that non-education graduates teaching in Higher Education Institutions had experienced difficulties in dealing with diverse learners, overloaded teaching loads, lack of instructional resources, and compliance with academic requirements. To address these challenges, they relied on innovative, technology-enhanced teaching strategies and support from colleagues and supervisors, which helped them manage their time efficiently and respond effectively to the needs of diverse learners.

On the other hand, Malgapo et al. (2020) emphasized that one persistent difficulty

How to cite:
Rodriguez, G. M. & Andrade, R. R. (2025). Challenges and Coping Strategies of Non-Education Graduate Mathematics Teachers in Senior High School: A Phenomenological Approach. *International Journal of Multidisciplinary: Applied Business and Education Research*. *6*(6), 3175 – 3183. doi: 10.11594/ijmaber.06.06.38

teachers encounter is managing students' behavior and attitudes toward learning mathematics. To address these challenges effectively, educators must employ pedagogical strategies and instructional methods that are responsive to the specific demands of each mathematical concept. However, despite the critical role of classroom instruction in fostering mathematical understanding, many schools continue to struggle with limited access to adequate teacher training and professional development. This situation is further compounded in several countries where teachers are often assigned to teach subjects outside their field of specialization, raising concerns about instructional quality and student outcomes.

In several countries, the issue of teachers being assigned to subjects outside their area of expertise remains a growing concern. In England, 18% of mathematics teachers at the post-primary level did not hold formal qualifications in the subject (Hillman, 2014 p. 23). Moreover, Baraquia (2022) reported that 26% of teachers with seven to ten years of experience in Australia are working outside their primary field. The Staff in Australia's Schools Survey further revealed that approximately 20% of mathematics teachers were considered out-of-field, a condition that has been linked to declines in students' mathematical performance (Hobbs & Torner, 2019). A similar scenario is evident in Washington, where Bayani and Guhao (2017) noted that, despite having formal teaching credentials, some educators were tasked with teaching subjects that were not aligned with their academic preparation or specialization.

In the Philippines, the rollout of the K to 12 Program, particularly at the Senior High School level, introduced a range of new challenges, most notably a shortage of qualified teachers (Recede et al., 2013). As a result, schools have increasingly relied on non-education graduates to teach mathematics, often without sufficient instructional training or content-specific preparation. Koskinen and Pitkäniemi (2022) argued that mathematics instruction is most effective when delivered by teachers with specialized knowledge and pedagogical expertise in the subject, ensuring that students gain a deep and meaningful understanding.

According to the Second Congressional Commission on Education (EDCOM II, 2023), there is an 18% mismatch in Mathematics teacher qualifications, highlighting the urgent need to strengthen support systems for non-education graduate instructors in the field. Given the critical role mathematics plays in everyday life and societal development, enhancing the quality of mathematics education must remain a national priority.

In a public senior high school in the Philippines, several mathematics subjects—including General Mathematics, Statistics and Probability, Pre-Calculus, Basic Calculus, Fundamentals of Accountancy, Business, and Management 1 and 2, Business Mathematics, and Business Finance—are currently being taught by non-education graduates. Although these teachers face a range of challenges in delivering content outside their specialization, their experiences have provided valuable insights for school administrators in formulating responsive strategies to address instructional gaps.

Recognizing the significance of ensuring that qualified mathematics educators lead classroom instruction, the researchers aim to contribute to the ongoing discourse on teacher quality. While previous studies, such as that of Malgapo et al. (2020), have examined the pedagogical approaches and techniques employed by non-education graduates teaching General Mathematics at the senior high school level, and Somosot et al. (2023) have explored the experiences of non-education graduates in higher education institutions, there appears to be a lack of focused research on the challenges and coping mechanisms of non-education graduates specifically within senior high schools in one of the cities in Quezon Province, Philippines.

The present study seeks to investigate the challenges encountered and the coping strategies employed by these non-education graduate senior high school mathematics teachers. Through this inquiry, the researchers aspire to generate meaningful findings that may inform future policies, teacher support systems, and professional development initiatives aimed at improving the delivery of mathematics education.

Methods

The study aimed to explore the challenges faced by non-education graduate mathematics teachers in senior high school, along with their coping strategies. A descriptive phenomenological approach was employed to gain a deeper understanding of their experiences. Participants were selected through purposive sampling, based on two key criteria: 1) they were non-education graduates assigned to teach mathematics at the senior high school level, and 2) they were employed within the Division of Quezon. A total of ten (10) teachers participated in the study, including six (6) females and four (4) males. A semi-structured interview guide was used for data collection.

The interview questions were designed to explore the challenges and coping strategies encountered by participants while teaching mathematics at the senior high school level. These questions were reviewed and validated by subject matter experts to ensure their relevance. Once the necessary data were gathered, the researchers proceeded with the processes of summarization, transcription, translation, and thematic analysis.

In line with Colaizzi's (1978) descriptive phenomenological method, as outlined by Morrow et al. (2015), the researchers began by immersing themselves in the data, carefully reviewing the participants' responses to understand the challenges and strategies they experienced. They then identified all responses related to the phenomenon being studied, focusing on interpretations that directly addressed the research questions. Through careful analysis, meanings associated with the phenomenon were extracted and grouped into common themes. These themes were used to construct a comprehensive description of the phenomenon. Finally, the researchers synthesized this description into a concise, meaningful statement that captured the core aspects of the challenges and coping strategies faced by non-education graduate mathematics teachers in senior high school.

Results and Discussions

Table 1. Challenges Encountered in Teaching Mathematics

Emerging Themes	Teachers' Responses
Lack of Classroom Management Skills	Difficulty in commanding the students (2) Difficulty in establishing long term rapport to students (4) Students see me as a friend buddy because of close age gap difference (4)
Struggle in the Selection of Appropriate Teaching Strategies	Unfamiliarity with wide range of Mathematics teaching strategies (7) No prior exposure to teaching field (2) Difficulty in using effective strategy (3) Difficulty teaching the needed competencies (5) It is hard to give passing grade to failing students (5) Less knowledge on proper procedure in lesson planning (2)
Lack of Subject Knowledge	Need to review the topic before teaching it (2) Unfamiliarity with Math Terminologies (1) Difficulty connecting the topic within or across curriculum (1) Teachers are tasked to do works that are outside their area of expertise which hinder to master the lesson (2)
Perceived Stigma	Teachers felt negative connotation as for being non-education graduates (2) I felt different from education graduates (2) I am unsure if I am an effective Math teacher (2)

From the data gathered, four (4) themes emerged on the challenges encountered in teaching Mathematics by the participants: (1)

lack of classroom management, (2) struggle in the selection of appropriate teaching strategies, (3) lack of subject knowledge, and (4) perceived stigma.

Lack of Classroom Management

It was revealed that participants have difficulties in choosing and applying proper classroom management strategies. Teacher F said that:

> *"The difficult part for me is classroom management with the TVL students. I handle the EIM strand. Their behavior is really different. If you become strict, they end up not attending class. But if you become lenient, they take advantage. So, it is really hard to balance classroom management, especially with them".*

The findings of this study highlight the classroom management difficulties experienced by non-education graduates assigned to teach mathematics in senior high schools in the Philippines. Participants particularly pointed out the behavioral challenges of students in certain strands, such as the Technical-Vocational-Livelihood (TVL) and Electrical Installation and Maintenance (EIM) tracks, and the difficulty of maintaining a balance between being too strict and too lenient.

These issues are reflective of the observations of Babasoro and Cabrillas (2024), who emphasized that non-education graduates taking on teaching roles, especially in subjects like mathematics, often enter the profession without formal pedagogical preparation. In doing so, they are confronted with the pressure of meeting student expectations and managing classroom dynamics that differ significantly from their prior academic or professional training.

In the Philippine context, where the demand for qualified teachers remains a pressing concern, these findings point to the urgent need for support programs and professional development initiatives tailored for non-education graduates teaching in the K to 12 system.

Struggle in the Selection of Appropriate Teaching Strategies

To effectively meet the diverse needs of learners, teachers need to adopt suitable and responsive instructional strategies. As noted by Somosot et al. (2023), the selection of teaching approaches plays a crucial role in ensuring meaningful and effective learning. However, this aspect often presents a gap among non-education graduates, whose limited pedagogical training may hinder their ability to implement differentiated instruction.

This observation resonates with the reflection of Teacher D, who admitted relying heavily on problem-solving tasks, only to later realize that such an approach did not translate to improved student performance. The teacher expressed that minimal preparation and limited variety in activities contributed to ineffective outcomes. Over time, she came to understand the importance of adjusting her strategies to account not only for students' personalities but also for their cognitive abilities. As Teacher D stated that:

> *"What I do is mostly focus on problem-solving since it is Mathematics, but later on, I see that it is ineffective because no matter how much I expose them to problem-solving, their scores still keep falling. I did not do a lot of activities or preparation because it is also difficult. I realized over time that I need to differentiate, not just based on personalities, but also on intellect, when I give activities ".*

This finding illustrates a broader issue regarding the instructional preparedness of non-education graduates who are assigned to teach specialized subjects like Mathematics. It reinforces the claim of Oluwatoyin et al. (2017), who asserted that individuals without formal training in education often encounter challenges in pedagogy, classroom communication, and instructional leadership. These limitations may affect the quality of teaching and, ultimately, student learning outcomes. As such, there is a clear need to support non-education graduate teachers

through targeted professional development programs that emphasize differentiated instruction and learner-centered pedagogies.

Lack of Subject Knowledge

Non-education graduates often invest considerable effort in preparing for their lessons, as they are typically not equipped with formal pedagogical training or in-depth content mastery (Ramli et al., 2017). This challenge was clearly expressed by Teacher D, as evident below, who shared that, unlike experienced educators who can deliver content with ease, she must devote time to reviewing the material before every class session. While the act of studying beforehand might seem routine, she described it as burdensome—a reflection of the additional cognitive and emotional load experienced by non-education graduates. Teacher D mentioned that:

> *"Another one is, you know, I need to study my lesson before entering the room, unlike other teachers who can teach even with their eyes closed. Although browsing through the material is a quick task to do, it's still a burden for me because I need to study first before going to the room".*

This insight points to a deeper issue in content mastery and instructional readiness. Effective teaching requires not only familiarity with the subject matter but also the ability to translate complex ideas into accessible learning experiences. As Co et al. (2021) emphasized, limited understanding of subject content can hinder a teacher's capacity to communicate abstract or challenging concepts, often resulting in misconceptions or fragmented understanding among students. In this context, the experiences of non-education graduates highlight the critical need for targeted support in both content knowledge and pedagogical strategies to ensure they are equipped to foster meaningful learning.

Perceived Stigma

A recurring concern raised by participants was the perceived stigma associated with being non-educational graduates. Teacher D expressed a strong sense of difference when comparing herself with colleagues who hold degrees in Mathematics education. She noted:

> *"In co-teaching, the way of thinking of Mathematics education graduates is different from ours when it comes to teaching Mathematics. They are more focused on books, while we are different. It feels like we have separate perspectives on everything, like strategies in the classroom and how we communicate with the students. I also feel the difference in our teaching effectiveness, based on the comments I hear from others".*

This sense of disconnection highlights an internalized professional divide, which may stem from differences in pedagogical training, classroom experiences, and external perceptions of teaching effectiveness. The feeling of inadequacy, amplified by informal feedback from peers or administrators, may weaken the confidence of non-education graduates and contribute to professional insecurities.

This observation supports the findings of Hobbs and Porsch (2021), who noted that teachers without formal education training often experience difficulties establishing themselves in the profession. While experience contributes to their development, it does not always compensate for the absence of foundational training in pedagogy. The lack of formal preparation may, over time, impact not only their instructional choices but also their self-perception as competent educators (Ingersoll, 2003). The study affirms the need to create inclusive, supportive professional environments where non-education graduate teachers are mentored and empowered rather than marginalized.

Table 3. Coping Strategies to Address the Challenges

Emerging Themes	Teachers' Responses
Collaborative Culture of Peer Support	Seek help from experienced colleague (7) Consult immediate head regarding teaching-related tasks (3)
Participating in Professional Development Activities	Earn units in Education (5) Advance study and Basic research (3) Engage in different trainings (6)
Resourcefulness in Teaching	Use learned strategies in teaching Mathematics (4
Being optimistic and passionate about teaching	Accepts criticisms and/or feedback given (5) Find fulfillment in what I am doing (10)

From the data gathered, four (4) themes emerged on the coping strategies employed to address the challenges: (1) collaborative culture of peer support, (2) participating in professional development activities, (3) resourcefulness in teaching, and (4) being optimistic and passionate about teaching

Collaborative Culture of Peer Support

Despite facing challenges in their teaching practice, non-education graduate Mathematics teachers actively seek guidance from their co-teachers. This approach reflects their recognition of the value of peer support in overcoming difficulties and improving their teaching effectiveness. As Teacher A shared:

> *"Perhaps one more thing is that I sit in the classroom while another teacher is teaching. I have a co-teacher whose way of handling the students I observe and try to imitate. I can see how the students respond, and they seem to enjoy it. I found this strategy effective".*

This strategy of learning by observation and imitation highlights the importance of collaboration in professional growth. As Tiainen and Lutovac (2022) assert, new teachers can overcome teaching obstacles and improve their instructional skills by engaging in professional dialogues and receiving guidance from peer mentors. The act of observing and reflecting on a more experienced teacher's approach not only fosters pedagogical growth but also creates opportunities for mutual support and learning.

The participants in this study also emphasized that peer assessments and classroom observations play a crucial role in enhancing their teaching. These practices enable them to reflect on their teaching methods, adapt to students' needs, and adopt strategies that are effective in improving learning outcomes.

Participating in Professional Development Activities

Teachers recognize the importance of continuous growth and actively engage in activities that foster their professional development. The findings of this study demonstrate that non-education graduate Mathematics teachers take deliberate steps to expand their knowledge. By equipping themselves with essential teaching pedagogies and understanding the educational contexts in which they teach, these teachers show a commitment to enhancing their instructional practices. This is reflected in the insight shared by Teacher C:

> *"I have decided to take units and the LET. Actually, of course, a big part of it is to get a permanent position, but another reason why I'm taking it is to learn how I should properly do my job."*

This statement illustrates that the pursuit of additional qualifications serves dual purposes: securing a stable teaching position and enhancing pedagogical effectiveness.

In addition to formal education, non-education graduate teachers also dedicate significant time to researching reliable educational resources. The use of digital tools, such as

Google and other search engines, plays a crucial role in helping teachers navigate lesson planning and delivery. As Teacher B noted,

"I also do research online and apply it to the students. I do advanced reading. I maximize the use of technology. I use videos, games, or Mathematics-related activities that the students would enjoy."

These insights highlight the proactive approach these teachers take in utilizing technology to engage students and enhance their teaching. The use of online resources allows them to expand their subject knowledge and enrich the learning experience for their students. This practice aligns with Akinde et al. (2017), who suggest that digital tools can help educators, particularly those without formal education training, improve their classroom readiness. By utilizing digital tools, teachers can bring theoretical knowledge into practical application, providing them with a more hands-on teaching experience and enabling them to better prepare for the challenges of the classroom.

Resourcefulness in Teaching

In the teaching and learning process, it is essential to develop appropriate strategies that support students' educational goals. Driven by a strong desire to improve the quality of their teaching, non-education graduate teachers actively apply the knowledge and skills they have gained from various training programs.

Teacher C emphasized the importance of technology in his classroom, noting: Specifically, he said:

"ICT is very important, especially when I use a drawing tablet because it is interactive. I learned all of this when I took the education units, so I apply different activities for the students. The interventions in ICT, EdTech, and using tools like Plicker cards, Mentimeter, etc. are still effective up to now because they grab their attention, especially during Mathematics time. When there is just someone solving problems in front, the students get sleepy. They become drowsy. When you call on them, they shake up front. But when they do something different, they become engaged. It becomes more engaging. It's effective in that way."

To address the challenges they face in teaching Mathematics, non-education graduates can incorporate various strategies, such as using visual aids, real-world examples, and hands-on activities. These methods can assist students in grasping mathematical concepts more effectively (Jian et al., 2022).

Being Optimistic and Passionate in Teaching

Non-education graduate Mathematics teachers demonstrated a positive outlook when receiving feedback that impacted their teaching performance. They embraced constructive criticism as a valuable opportunity for growth. One participant shared:

"When there is a classroom observation, everything is being explained during post-conference. When issues evolving classroom management arose, consistent tips and feedback are being given by my coordinators. I take their feedback into consideration and put those into practice."

Despite the challenges, these teachers find a deep sense of fulfillment in their work. Teacher A remarked:

"In teaching, I can immediately see the effect of my work on the students. It makes me see my purpose more clearly. It is like food for the soul. It is fulfilling."

This aligns with Aarti (2025), who emphasized that teaching provides the opportunity to positively impact children's lives, foster learning, and influence the future. Teaching offers a meaningful and fulfilling career where one can make a lasting difference and contribute to society.

Conclusion

Non-education graduate Mathematics teachers face several challenges, particularly in

classroom management, selecting effective teaching strategies, and mastering subject content. These difficulties often stem from a lack of formal education training, limited exposure to teaching methodologies, and gaps in subject knowledge. Additionally, the perceived stigma of being non-educational graduates affects their confidence. Despite these challenges, teachers find fulfillment in their work, often directly observing the positive impact on students' learning. They show resilience by seeking peer support, participating in professional development, and applying learned strategies to improve their teaching.

To support non-education graduate Mathematics teachers, schools need to offer targeted professional development that focuses on teaching strategies, classroom management, and subject knowledge. This training should be designed to address the specific challenges faced by these teachers, especially in utilizing modern educational tools effectively.

Furthermore, implementing mentorship programs where experienced teachers guide and support non-education graduates would help improve teaching practices and build confidence. Encouraging these teachers to pursue further education through formal courses would significantly enhance their pedagogical understanding and mastery of the subject. Schools should also prioritize providing classroom management training to help teachers establish better rapport with students, particularly those dealing with age gaps.

Lastly, recognizing the efforts and progress of non-education graduate teachers can motivate them to continue developing their skills and contribute to creating a more positive and effective teaching environment. By addressing these key areas, non-education graduate teachers can be empowered to overcome their challenges and improve their overall teaching effectiveness.

Acknowledgment

The researcher wishes to extend her heartfelt gratitude and appreciation to those persons and authorities who selflessly extended their time and effort to succeed and complete this study.

Laguna State Polytechnic University-San Pablo Campus, whose effort is highly appreciated in transforming the vision and mission into the reality that motivates the researcher to continue graduate studies;

Gulang-Gulang National High School, for allowing the researcher to conduct the study during her free time which helped in finishing this research study;

And **Rodriguez and Montellano family**, for their genuine love and moral support right from the start and until the end of the conduct of the study.

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