



Enhancing numeracy skills in multigrade classrooms: Instructional challenges and teaching strategies

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ABSTRACT

This study examined the strategies and struggles of multigrade teachers in improving learners' numeracy skills using a qualitative research design. Data were collected through Google Forms distributed to elementary multigrade teachers, and thematic analysis was used to interpret the responses. The findings revealed that multigrade teachers encounter challenges in lesson planning, classroom management, and preparation of instructional materials when teaching numeracy. Despite these challenges, teachers employ strategies such as differentiated instruction, peer tutoring, visual aids, and manipulatives to enhance learner engagement and understanding. External support from school administrators, colleagues, and the community was also found to help improve instructional practices. Overall, the study concludes that adaptive teaching strategies and institutional support play important roles in improving numeracy instruction in multigrade classrooms.

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Introduction

Numeracy skills are foundational to learners' academic success and everyday functioning, serving as a critical component of quality education. Strong numeracy enables learners to solve problems, make informed decisions, and participate productively in society. In elementary education, the development of these skills is especially vital, as early numeracy competence predicts later achievement in mathematics and other subject areas (Duncan et al., 2007; OECD, 2020). Teachers play a central role in shaping numeracy learning experiences, particularly in contexts where instructional resources and conditions are challenging (UNESCO, 2020; Cambridge University Press, 2025).

In many rural and underserved communities, multigrade classrooms remain a practical response to limited resources, teacher shortages, and low enrollment (Little, 2006; UNESCO, 2020). In such settings, a single teacher handles learners from two or more grade levels simultaneously. While multigrade teaching promotes flexibility and inclusivity, it also presents unique instructional challenges, especially in teaching numeracy. Teachers must manage varied curricula, learning paces, and developmental levels within one classroom, often with limited instructional materials and support. These conditions can affect the quality of numeracy instruction and learners' mastery of essential mathematical skills (Mulryan-Kyne, 2007; Urma & Callo, 2023).

Despite the prevalence of multigrade teaching, there is limited empirical research on the specific strategies multigrade teachers employ to improve numeracy and the challenges they encounter in the process. Existing studies tend to emphasize general classroom management or literacy development, leaving a gap in understanding how numeracy instruction is adapted and implemented in multigrade contexts. Moreover, teachers' lived experiences, coping mechanisms, and pedagogical innovations in such environments remain under-documented, particularly in elementary settings (Aina, 2019; Ares-Ferreirós, Álvarez Martínez-Iglesias, & Bernárdez-Gómez, 2025).

This study is motivated by the need to generate evidence-based insights into the instructional strategies and challenges of multigrade teachers in enhancing learners' numeracy skills. By exploring their practices and struggles, the research aims to inform school administrators, policymakers, and curriculum developers in designing targeted interventions, professional development programs, and instructional resources tailored to multigrade contexts (Department of Education, 2016; UNESCO, 2020). Ultimately, the study seeks to contribute to improved numeracy outcomes and more equitable educational opportunities for learners in multigrade classrooms.

Review of related literature

This review of related literature and studies provides a foundation for examining current research that focuses on the dual themes of strategies and challenges in teaching numeracy in multigrade classrooms. The study explores how elementary teachers design and implement instructional practices to improve learners' numeracy skills, as well as the obstacles they face in managing classrooms with learners from multiple grade levels.

Multigrade teaching strategies in recent research

Recent empirical studies have examined instructional practices employed by multigrade teachers to address diverse learner needs. A phenomenological study conducted in the Upper Calanasan District, Apayao, revealed that teachers utilize adaptive strategies such as peer tutoring, differentiated instruction, project-based learning, and technology integration to manage multilevel classes effectively (Bagay, 2025). These strategies demonstrate how teachers modify instruction to accommodate varying learner abilities and curricular demands. Furthermore, the study emphasized that professional development and supportive educational policies play a crucial role in enhancing teacher effectiveness and well-being in multigrade contexts.

Similarly, a correlational study in the Maigo District found that differentiated instruction, collaborative learning, and flexible grouping were significantly associated with improved academic performance in multigrade classrooms. Although the study focused on general academic outcomes, its findings highlight essential learner-centered approaches applicable to numeracy instruction. These results are consistent with earlier research asserting that differentiation and cooperative learning enhance learner engagement and achievement in multigrade settings (Little, 2006; UNESCO, 2020).

A recent state-of-the-art review further reinforces the view that multigrade teaching requires contextualized pedagogical adaptations due to the complexity of managing multiple grade levels in a single classroom. The review emphasizes the effectiveness of participatory and cooperative learning approaches in promoting engagement and supporting diverse learners (Castro Romero & Rodríguez Hernández, 2025). Collectively, these studies suggest that effective multigrade instruction is grounded in flexible, learner-centered pedagogies that respond to students' varying needs.

Challenges and professional development needs

Despite the effectiveness of these instructional strategies, contemporary research consistently highlights the challenges faced by multigrade teachers. A qualitative study conducted in Eastern Samar identified resource limitations, pedagogical difficulties, insufficient training, and psychological stress as key factors affecting teachers' ability to deliver quality instruction. These findings indicate that, beyond classroom strategies, systemic support mechanisms are essential for sustaining effective teaching in multigrade environments.

Similarly, narratives of multigrade teachers in Cervantes, Ilocos Sur, revealed challenges related to time management, lesson differentiation, and limited contextualized resources. Teachers reported developing innovative coping strategies, including peer collaboration and contextualized lesson design, to address these issues. However, the study underscored the need for structured and continuous professional development, particularly in classroom management and differentiated instruction (Cabaraban et al., 2018).

These findings align with broader literature suggesting that multigrade teachers often experience increased workload, resource constraints, and the need for ongoing professional training to effectively manage diverse learners (Little, 2006; UNESCO, 2020). Research on differentiated instruction further supports this claim, indicating that while teachers attempt to implement differentiated practices, they continue to encounter challenges due to limited resources and insufficient preparation. This highlights the importance of sustained professional development programs tailored to multigrade contexts (Tomlinson, 2014; Castro Romero & Rodríguez Hernández, 2025).

Numeracy instruction in a multigrade context

Numeracy instruction in multigrade classrooms presents unique challenges due to varying learner proficiency levels and developmental stages. A study conducted in Sorsogon (2024) found that although teachers employed flexible grouping and integrative learning strategies, learners exhibited varying levels of numeracy competence, with some domains remaining challenging across grade levels. This suggests

that numeracy instruction in multigrade settings requires continuous adaptation and targeted instructional support.

These findings are supported by previous studies that emphasize the need for differentiated and scaffolded approaches to address the diverse needs of learners in multigrade classrooms (Bruner, 1960; Little, 2006; UNESCO, 2020). Additionally, national policy frameworks highlight the importance of strengthening foundational numeracy skills through contextualized and learner-centered instruction (Department of Education, 2016).

Statement of the problem

This study aims to explore the strategies and instructional challenges faced by multigrade teachers in improving numeracy skills.

Specifically, the study seeks to answer the following research questions:

1. What are the strategies used by multigrade teachers in improving the numeracy skills of the learners?
2. What are the struggles faced by multigrade teachers in teaching numeracy skills to the learners?

Methodology

This section outlines the step-by-step process for gathering the necessary data for this study. It includes a thorough discussion of the paper's research design, research locale, population and sampling procedure, the research instrument, data collection method, data analysis, and ethical consideration.

Research design

This study is grounded in a qualitative research design, specifically the phenomenological approach. Through this approach, the researchers delved deeper into the lived experiences of multigrade teachers, thereby formulating themes that reflected the challenges encountered and the strategies used by the respondents in teaching their numeracy classes.

Locale of the study

The study will be conducted in the municipality of Bangui, Ilocos Norte. With pre-identified schools offering a multigrade education program, the chosen area aligns with the study's aim.

Additionally, since the researcher is a native of the said municipality, the accessibility to research data also plays a crucial role in the choice of the research locale. It is also believed that it is critical to resolve an immediate problem within a nearby scope before implementing it at a larger scale.

Population and sampling

This study concerns the elementary school teachers handling multigrade level classes in Bangui District.

The choice of respondents aligned with the study's aim, as the researcher believes these respondents have a rich background relevant to the study's aims. In addition, respondents should meet the study criteria:

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having at least 1 year of multigrade teaching experience and being actively involved in teaching numeracy classes.

Data gathering instrument

In gathering data for the study, the researcher uses a researcher-developed semi-structured interview guide. The interview guide closely examines the challenges encountered and the strategic adaptation methods used by the respondents in planning, instructional delivery, materials and facilities, and classroom management.

The semi-structured interview guide will focus on the data needed to answer the research questions. Furthermore, it will be conducted on an online platform using Google Forms, ensuring an easier and more efficient way to gather data.

Data gathering procedure

Before administering the online interview, the researcher will reach out to the immediate heads of the pre-identified respondents in the study to obtain their permission and approval to collect the pertinent data for this research. Once approval is obtained, letters to respondents will also be provided to inform them of the study's aims and their right to withdraw from the study if any untoward experiences persist.

The administration of the online interview, via Google Forms, will commence afterward. The interview link will be sent to respondents via email or messenger. While interview sessions must be conducted face-to-face, using the online platform will ease the burden on both the researcher and the respondents, as they can access the tool at their convenience.

Furthermore, to offset the absence of physical interaction, additional questions will be asked to ensure that vague or ambiguous statements are clearly understood during data analysis.

Data analysis tool

As far as qualitative data is concerned in this study, the researcher will use Braun and Clarke's (2006) six-phase thematic analysis. Thematic analysis suits this study best, as it enables the generation of themes that highlight the study's findings.

In developing the themes, all gathered responses will be coded. These codes will provide sub-themes to ensure that related ideas are grouped. Finally, themes will be extracted by combining similar sub-themes.

Ethical considerations

Regarding research ethics, respondents will not be forced to participate in the study. Through the letters forwarded to them, they will be informed of the study's parameters. The letter also states that they may withdraw from the study if they encounter any problems.

In addition, their responses will be deleted once all necessary data has been collected to ensure data privacy is maintained. Refreshments and monetary compensation will not be given.

Data presentation and analysis

The responses from multigrade teachers revealed key challenges and strategies for teaching numeracy in multilevel classrooms. Participants highlighted difficulties with lesson planning, classroom management, and instructional delivery, as well as limited resources, and demonstrated adaptive strategies such as differentiated instruction, independent learning activities, and peer tutoring (UNESCO, 2020; Hattie, 2017).

The findings indicate that multigrade teaching requires flexibility and effective organization to address diverse learner needs and manage multiple groups simultaneously. Despite existing constraints, teachers showed resourcefulness in sustaining learner engagement and supporting numeracy development. Overall, the thematic analysis provides insight into both the challenges and the practical strategies that shape numeracy instruction in multigrade settings (OECD, 2019; Department of Education, 2022).

Problem 1: What are the strategies used by multigrade teachers in improving the numeracy skills of the learners?

Theme 1: Strategic lesson planning for multigrade instruction

Codes / Responses	Frequency	Interpretation
Preparing two lesson plans for two grade levels	6	Teachers design parallel lesson plans to address multiple grade levels.
Different competencies and curriculum objectives	4	Instruction is aligned with distinct learning goals for each group.
Difficulty aligning lesson objectives and activities	3	Teachers integrate objectives through combined or flexible lesson structures.
Need to prepare differentiated activities	1	Lessons are adapted to accommodate diverse learner abilities.

Note: Responses were coded based on common themes related to lesson-planning difficulties experienced by multigrade teachers.

The thematic analysis revealed that multigrade teachers employ strategic lesson-planning approaches to address the complexities of managing multiple grade levels. Teachers design parallel or combined lesson plans that align with the competencies and curriculum requirements of each group. To address varying learning objectives, teachers integrate or sequence activities to allow simultaneous or staggered instruction across grade levels.

Additionally, differentiated instruction is used as a key planning strategy, in which teachers modify learning tasks to meet the needs of both struggling and advanced learners. This includes adjusting content, pacing, and instructional approaches to ensure inclusivity and effectiveness. These strategies reflect teachers' ability to adapt instruction despite the inherent complexity of multigrade settings.

These findings align with literature emphasizing that effective multigrade lesson planning requires instructional flexibility and pedagogical adaptation (UNESCO, 2020; Department of Education, 2022).

The use of differentiated instruction further supports learner diversity and promotes inclusive learning environments (Tomlinson & Moon, 2017; Hattie, 2017). Overall, strategic lesson planning enables teachers to manage multiple curricula while maintaining instructional coherence.

Theme 2: Time management and structured preparation strategies

Codes / Responses	Frequency	Interpretation
Preparing multiple worksheets and activities	5	Teachers develop structured materials for independent and guided learning.
Limited time to prepare lessons	4	Teachers maximize available time through efficient planning practices.
Difficulty organizing independent and guided activities	3	Tasks are structured to allow simultaneous learning across groups.
Managing multiple assessments	2	Teachers design assessment strategies for different grade levels.

Note: Codes were recategorized to highlight time management and preparation strategies.

The analysis showed that multigrade teachers use time-management and structured preparation strategies to cope with the demands of lesson planning. Teachers prepare multiple worksheets, activities, and assessment tools in advance to ensure that learners remain engaged even when direct instruction is focused on another group. These materials are carefully designed to support independent learning while maintaining alignment with lesson objectives.

Teachers also organize lessons by structuring independent and guided activities, allowing one group to work autonomously while the other receives instruction. This strategic allocation of time helps maximize classroom efficiency and ensures continuous learner engagement. In addition, teachers employ systematic approaches in managing assessments by preparing parallel evaluation tools for different grade levels.

These findings are consistent with research highlighting that effective time management is essential in multigrade teaching, where teachers must balance multiple instructional demands (UNESCO, 2020; Department of Education, 2022). Studies also emphasize that structured learning tasks and advanced preparation enhance instructional efficiency and reduce cognitive load among teachers (Hattie, 2017; OECD, 2019).

Overall, the use of time management and structured preparation strategies demonstrates teachers' capacity to organize complex instructional tasks, ensuring that learning continues productively despite time constraints.

Theme 3: Use of differentiated and independent learning activities

Codes / Responses	Frequency	Interpretation
Use of printed worksheets	5	Worksheets allow learners to work independently while the teacher assists another group.
Grouping learners according to ability	4	Ability grouping helps teachers manage diverse learning needs.
Step-by-step learning tasks	3	Structured activities guide learners in understanding numeracy concepts.
Independent learning activities	2	Learners complete tasks independently while waiting for teacher instruction.

Note: Codes were developed from strategies teachers use to manage multigrade instruction.

Thematic responses revealed that teachers employ differentiated and independent learning activities to effectively manage instruction across multiple grade levels. Teachers commonly use printed worksheets to allow learners to work independently while they provide direct instruction to another group. This approach helps maximize instructional time and ensures that all learners remain engaged in meaningful learning tasks.

Respondents also reported grouping learners by ability, enabling them to tailor instruction to learners' readiness levels. Additionally, the use of step-by-step learning tasks was identified as an important strategy to scaffold learners' understanding of numeracy concepts, particularly for those who require additional guidance. These structured and independent activities help maintain classroom flow while promoting learner autonomy.

These findings are consistent with recent literature emphasizing that differentiated instruction is essential in addressing the diverse learning needs present in multigrade classrooms (Hattie, 2017; Tomlinson & Moon, 2017). Studies also highlight that the use of structured, self-directed activities enables learners to engage in meaningful learning even without direct teacher supervision, which is crucial in multigrade settings (UNESCO, 2020; OECD, 2019).

Furthermore, research indicates that ability grouping and scaffolded learning tasks can enhance learner understanding by providing appropriate levels of challenge and support (Aina, 2019; Urma & Callo, 2023). These strategies demonstrate that effective numeracy instruction in multigrade classrooms relies on a combination of flexibility, structured guidance, and learner-centered approaches. Overall, the use of differentiated and independent learning activities reflects teachers' adaptive strategies in managing instructional demands while promoting numeracy development.

Theme 4: Use of peer tutoring and visual learning materials

Codes / Responses	Frequency	Interpretation
Peer tutoring among learners	6	Advanced learners assist classmates who need help.

Use of visual aids and charts	4	Visual materials help simplify mathematical concepts.
Use of manipulatives and concrete objects	3	Hands-on materials improve understanding of numeracy skills.
Demonstration and guided examples	1	Teachers use demonstrations to explain mathematical procedures.

Note: Responses were grouped according to instructional strategies that support numeracy learning.

Peer tutoring emerged as a significant instructional strategy in multigrade classrooms, where advanced learners assist their peers experiencing difficulty with numeracy tasks. This collaborative approach not only supports struggling learners but also reinforces peer tutors' understanding through active engagement. In addition, teachers reported using visual aids, charts, and other illustrative materials to simplify abstract mathematical concepts, making them more accessible to learners with varying levels of understanding.

The use of manipulatives and concrete objects was also identified as an effective strategy in improving learners' comprehension of numeracy concepts. These hands-on materials allow learners to engage in experiential learning, which is particularly beneficial in developing foundational mathematical skills. Teachers further emphasized the use of demonstrations and guided examples to model procedures and clarify complex concepts, ensuring that learners can follow step-by-step processes.

These findings are consistent with recent research highlighting the effectiveness of collaborative learning strategies, such as peer tutoring, in enhancing learner engagement and achievement in diverse classroom settings (UNESCO, 2020; OECD, 2019). Studies also emphasize that the use of visual and concrete materials supports conceptual understanding, particularly in mathematics, where abstract ideas are better learned through tangible representations (Hattie, 2017; Aina, 2019).

Furthermore, research suggests that peer-assisted learning and the use of manipulatives promote active participation and deepen understanding, especially in classrooms with mixed ability levels such as multigrade settings (Urma & Callo, 2023). These strategies reflect teachers' efforts to create an inclusive and supportive learning environment that fosters both academic achievement and learner collaboration. Overall, the use of peer tutoring and visual learning materials demonstrates an effective approach to addressing the diverse needs of learners while strengthening numeracy instruction.

Problem 2: What struggles do multigrade teachers face when teaching numeracy skills to learners?

Theme 5: Managing learner behavior and attention

Codes / Responses	Frequency	Interpretation
Learners become noisy when the teacher focuses on another group	6	Maintaining discipline becomes challenging when attention is divided.
Learners lose focus while waiting	4	Some students become disengaged during waiting time.

Difficulty maintaining learner participation	3	Teachers struggle to keep all learners actively engaged.
Disruptive behavior among learners	1	Some learners disturb others during lesson activities.

Note: Responses were categorized based on classroom behavior and learner engagement during lesson delivery.

Thematic analysis revealed that maintaining learner attention and discipline is a persistent challenge during lesson delivery in multigrade classrooms. Teachers reported that while one group is receiving instruction, learners from another group often become noisy, distracted, or disengaged. Additionally, some learners tend to lose interest while waiting for their turn to participate in instructional activities, which can lead to reduced engagement and occasional disruptive behavior.

These findings suggest that divided teacher attention significantly affects classroom management and learner participation in multigrade settings. This is consistent with recent literature emphasizing that managing multiple groups simultaneously requires highly developed classroom management skills and structured instructional routines (UNESCO, 2020; Department of Education, 2022). Studies also indicate that learner disengagement often occurs during unstructured waiting time, highlighting the importance of continuous and meaningful task engagement to sustain attention (Hattie, 2017; OECD, 2019).

Furthermore, research shows that maintaining active participation among diverse learners is particularly challenging in multigrade classrooms due to differences in learning pace, readiness, and interest (Urma & Callo, 2023). Without well-designed independent or collaborative activities, learners who are not directly engaged by the teacher are more likely to exhibit off-task or disruptive behavior (Aina, 2019). These findings underscore the need for structured classroom management strategies, effective time allocation, and engaging instructional techniques to ensure all learners remain actively involved throughout the lesson.

Theme 6: Divided teacher attention and limited instructional time

Codes / Responses	Frequency	Interpretation
The teacher's attention is divided between two groups	6	Teachers find it difficult to provide equal attention to all learners.
Limited time to explain lessons thoroughly	4	Instructional time is insufficient for both grade levels.
Difficulty in monitoring learners simultaneously	3	Teachers struggle to supervise multiple groups at the same time.
Challenges in covering all lesson content	1	Some lessons cannot be completed within the given time.

Note: The responses were coded based on challenges related to time management and teacher attention.

Divided teacher attention and limited instructional time are significant challenges during lesson delivery in multigrade classrooms. Respondents expressed difficulty in allocating equal attention to multiple

grade levels, as teaching one group often results in reduced supervision and engagement of the other. Teachers further explained that limited class time restricts their ability to explain lessons thoroughly, monitor learner progress effectively, and complete all required lesson content within the allotted period. These findings indicate that instructional time pressure and divided attention are inherent challenges in multigrade teaching, where teachers must simultaneously manage multiple instructional demands. This is consistent with recent literature emphasizing that multigrade classrooms require teachers to balance content coverage and learner understanding within constrained time frames (UNESCO, 2020; Department of Education, 2022). Studies also suggest that the division of teacher attention can affect instructional quality, as learners may receive unequal opportunities for guidance and feedback (OECD, 2019; Hattie, 2017).

Moreover, research highlights that effective monitoring of learners in multigrade settings is particularly challenging due to differences in learning pace and task complexity, which require continuous teacher presence and support (Urma & Callo, 2023). Without structured instructional routines and well-designed independent learning tasks, teachers may struggle to ensure that all learners are adequately supported. These findings underscore the need for strategic time management, structured lesson organization, and institutional support to help teachers address the competing demands of multigrade instruction.

Theme 7: Limited instructional materials

Codes / Responses	Frequency	Interpretation
Insufficient manipulatives and teaching materials	6	Lack of materials limits hands-on numeracy activities.
Materials shared between groups	4	Sharing resources sometimes disrupts classroom flow.
Need to create additional learning materials	3	Teachers spend extra effort preparing materials for different levels.
Lack of specialized multigrade resources	1	Few materials are specifically designed for multigrade instruction.

Note: Codes were based on responses related to instructional materials and classroom resources.

The analysis revealed that the limited availability of manipulatives and instructional resources is a major challenge in multigrade numeracy instruction. Respondents reported that learning materials are often insufficient and must be shared between groups, which can disrupt classroom flow and reduce learner engagement, particularly during hands-on activities. In addition, teachers highlighted that preparing instructional materials for multiple grade levels requires additional time and effort, further increasing their workload.

These findings indicate that resource limitations significantly affect the quality of instruction and the implementation of effective numeracy strategies in multigrade classrooms. This is consistent with recent studies emphasizing that adequate instructional materials are essential in facilitating active learning and improving mathematical understanding (UNESCO, 2020; World Bank, 2018). Research also suggests that the lack of manipulatives and context-appropriate resources can hinder learners’ conceptual

understanding, particularly in mathematics, where concrete experiences are crucial (Hattie, 2017; OECD, 2019).

Furthermore, the scarcity of specialized materials designed for multigrade instruction highlights persistent resource gaps in many elementary learning environments, particularly in rural and underserved areas (Department of Education, 2022; Urma & Callo, 2023). Teachers are often required to improvise or create their own materials, which adds to their workload and may affect instructional consistency. These findings underscore the need for improved resource allocation, development of context-specific instructional materials, and institutional support to enhance the effectiveness of numeracy instruction in multigrade settings.

Theme 8: Maintaining classroom discipline and engagement

Codes / Responses	Frequency	Interpretation
Learners become distracted while working independently	5	Maintaining learner focus during independent tasks is difficult.
Some learners disturb other groups	4	Noise and distractions affect learning activities.
Difficulty supervising different learning speeds	3	Teachers must monitor both fast and slow learners simultaneously.
Need for constant monitoring	2	Teachers must frequently check learner progress and behavior.

Note: Responses were categorized according to classroom management issues encountered by teachers.

Classroom management difficulties emerged as a persistent challenge among multigrade teachers. Respondents reported that learners often become noisy, distracted, or disrupt other groups while engaged in independent or group tasks. These behaviors are more pronounced when teacher attention is directed toward a specific group, leaving other learners less supervised. As a result, maintaining discipline and sustaining engagement across multiple groups becomes increasingly complex.

In addition, monitoring learners with varying learning speeds was identified as a significant challenge. Teachers emphasized that balancing supervision and instructional guidance requires strong organizational skills, as they must simultaneously attend to fast learners who require enrichment and struggling learners who need additional support. This situation demands continuous monitoring to ensure that all learners remain on task and achieve the intended learning outcomes.

These findings are consistent with recent literature indicating that classroom management complexity increases in multigrade instructional settings due to the diversity of learner needs and the simultaneous management of multiple learning groups (UNESCO, 2020; Department of Education, 2022). Research further suggests that effective classroom management in such contexts requires structured routines, clear expectations, and continuous learner engagement to minimize off-task behavior (Hattie, 2017; OECD, 2019).

Moreover, studies highlight that differences in learning pace and task engagement can contribute to behavioral challenges if not properly addressed through differentiated and well-structured instructional activities (Urma & Callo, 2023; Aina, 2019). Without adequate support systems and classroom management strategies, teachers may struggle to maintain an organized and productive learning environment. These findings underscore the importance of strengthening teachers' classroom management competencies and providing institutional support to address the complexities of multigrade instruction.

Results and discussions

Multigrade teachers encounter significant challenges in planning numeracy lessons due to the complexity of addressing multiple grade levels simultaneously. Teachers reported difficulty in aligning learning competencies, designing appropriate activities, and preparing lesson plans that respond to diverse learner needs. Each grade level requires distinct instructional approaches, increasing both cognitive and preparatory demands. Time constraints further complicate this process, as teachers must prepare multiple worksheets, activities, and assessments. These results are consistent with studies emphasizing that multigrade teaching requires flexibility and extensive planning (UNESCO, 2020; Department of Education, 2022) and align with differentiated instruction theory, which highlights the need to adapt content and processes to learner variability (Tomlinson & Moon, 2017).

During lesson delivery, teachers experienced challenges in managing learner behavior and sustaining attention, particularly when focusing on one group at a time. Learners often became distracted, disengaged, or noisy while working independently. Teachers also struggled to divide their attention across multiple grade levels, limiting their ability to provide immediate feedback. Time constraints intensified these difficulties, as instructional periods were insufficient to provide thorough explanations and ensure mastery of concepts. These findings reflect the complexity of multigrade classrooms, where effective classroom management and time allocation are essential (OECD, 2019; Hattie, 2017).

Moreover, the limited availability of instructional materials and the difficulty of maintaining classroom discipline are identified as challenges. Teachers reported a lack of manipulatives, visual aids, and other resources necessary for effective numeracy instruction, restricting opportunities for hands-on and interactive learning. Managing learners during independent tasks was also difficult, as some became distracted or disruptive. Monitoring all learners simultaneously posed additional challenges in a multigrade setting. These findings are consistent with literature emphasizing the importance of adequate resources and effective classroom management in improving learning outcomes (UNESCO, 2020; World Bank, 2018).

To manage these challenges, teachers utilized strategies such as differentiated instruction, independent tasks, peer tutoring, and the use of visual and concrete materials. Worksheets supported independent work, while ability grouping and peer tutoring addressed diverse learning needs. Visual aids and manipulatives further enhanced numeracy understanding. These practices align with learner-centered approaches identified in the literature (Hattie, 2017; Tomlinson & Moon, 2017; UNESCO, 2020).

Overall, the study contributes to both theory and practice by extending differentiated instruction and constructivist learning theories in multigrade contexts. It demonstrates that differentiation becomes a structural necessity in managing multiple curricula, while constructivist strategies such as peer tutoring and hands-on learning enhance understanding (Bruner, 1960). In practical terms, the findings highlight the need for institutional support, including professional development and specialized instructional materials. At the classroom level, strategies such as structured independent learning and peer-assisted activities offer effective ways to improve learner engagement and numeracy outcomes despite existing constraints.

Conclusion

Multigrade teachers face significant challenges in planning and delivering numeracy instruction due to the complexity of managing multiple grade levels simultaneously. Lesson preparation demands additional time and effort, as teachers must design differentiated activities, align learning objectives, and manage instructional pacing across classes. Classroom management is also a persistent concern, with difficulties in maintaining learners' attention, minimizing noise, and supervising multiple tasks at once. These challenges highlight the need for pedagogical flexibility to address diverse learner needs (UNESCO, 2020; Baturo & Nason, 2019).

Moreover, limited instructional materials and inadequate classroom facilities further constrain effective numeracy instruction, consistent with the Department of Education (Philippines) (2016) emphasis on providing sufficient learning resources. Despite these constraints, multigrade teachers demonstrate adaptability by employing strategies such as differentiated instruction, peer tutoring, and the use of visual aids, worksheets, and manipulatives to enhance learner engagement and comprehension—approaches widely recognized as effective in multigrade settings (Little, 2006; UNESCO, 2020).

The presence of external support from school administrators, colleagues, and community stakeholders further strengthens instructional practices. Overall, while multigrade teaching presents instructional and classroom management challenges, adaptive strategies and institutional support are crucial to improving numeracy instruction and supporting learner development.

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