

**Teaching Mathematics 4: Teachers' perspectives
in Philippine public elementary schools**

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ABSTRACT

Mathematics education plays an important role in developing pupils' reasoning, problem-solving skills, and understanding of everyday situations. However, limited local evidence describes how Grade 4 Mathematics is actually implemented from the perspective of teachers in public elementary schools in Gamu District. This study examined the teaching of Mathematics 4 in terms of curriculum implementation, instructional practices, learning resources, assessment, administrative and supervisory support, and factors affecting instruction. Using a descriptive survey design, the study involved 17 Grade 4 Mathematics teachers from public elementary schools in Gamu District during School Year 2025–2026. Data were gathered through a researcher-developed questionnaire and supplemental interviews and were analyzed using frequency, percentage, and weighted mean. The findings showed that Mathematics 4 performance standards were realized, while teaching methods, instructional materials, assessment tools, and administrative and supervisory support were generally rated very effective. Factors affecting instruction were considered manageable. The study recommends differentiated instruction, peer tutoring, formative assessment, multiple representations, continuing teacher development, and stronger support for managing diverse and large classes.

Keywords: Mathematics 4, mathematics instruction, elementary teachers, curriculum implementation, instructional practices.

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INTRODUCTION

Mathematics is a foundational area of elementary education. It develops learners' ability to reason, solve problems, interpret information, and make decisions in everyday situations. The National Research Council (2001) emphasized that mathematical proficiency involves more than computational skill. It includes conceptual understanding, procedural fluency, strategic competence, adaptive reasoning, and productive disposition. For elementary learners, these competencies provide the foundation for later learning in mathematics and other disciplines.

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Despite its importance, mathematics remains challenging for many learners. Difficulties may arise from weak foundational knowledge, limited opportunities to explain mathematical thinking, ineffective instructional practices, and insufficient learning resources. Hiebert and Grouws (2007) explained that the nature of classroom mathematics teaching has a substantial influence on the quality of students' learning. Similarly, the National Council of Teachers of Mathematics (NCTM, 2014) identified effective mathematics teaching as instruction that supports reasoning, meaningful problem solving, productive discourse, strategic use of representations, and connections among mathematical ideas.

In the Philippine context, these concerns are particularly relevant. The implementation of the K to 12 curriculum placed greater emphasis on developing learners' critical thinking and problem-solving abilities. Balagtas et al. (2019) found that the Philippine Grade 4 Mathematics curriculum showed relatively strong alignment with the TIMSS framework, although they also emphasized the need for continuing curriculum improvement and appropriate intervention programs. Barrot (2023) likewise noted that the implementation of curriculum reforms may be affected by instructional delivery, assessment, lesson preparation, technology integration, and the capacity of teachers and school leaders.

The teaching of Grade 4 Mathematics therefore requires more than the presentation of mathematical rules and procedures. Teachers need to determine what learners already know, identify misconceptions, select appropriate strategies, provide meaningful representations, and assess learning continuously. As explained by the National Research Council (2000), learners enter classrooms with existing ideas that influence how they interpret new information. Effective instruction should therefore connect new mathematical concepts with learners' prior knowledge and experiences.

Classroom interaction is another important dimension of mathematics instruction. Students need opportunities to explain solutions, compare strategies, ask questions, and justify their reasoning. NCTM (2014) emphasizes the importance of facilitating meaningful mathematical discourse and encouraging students to reason and communicate mathematically. Cooperative learning can also contribute to achievement when it is carefully structured. A recent meta-analysis reported a positive effect of cooperative learning on primary students' mathematics achievement, although the magnitude of the effect varied across instructional models and contexts (The effect of cooperative learning toward mathematics achievement of primary students, 2025). In the Philippine setting, Bacsal et al. (2022) likewise found that the jigsaw strategy improved mathematics achievement among elementary pre-service teachers and contributed to their interest in mathematics.

Instruction should also respond to differences among learners. Magayon and Tan (2020) found evidence that Filipino mathematics teachers use differentiated instruction by modifying content, processes, activities, and assessments according to learners' readiness and interests. For elementary mathematics, such responsiveness is important because learners do not enter the classroom with the same level of mathematical knowledge or confidence. The What Works Clearinghouse (2021) recommends systematic instruction, explicit mathematical language, and carefully selected concrete and semi-concrete representations for learners who experience difficulties in mathematics.

The use of instructional materials is consequently an important consideration in Grade 4 Mathematics. Concrete materials, visual representations, diagrams, manipulatives, and other learning resources can help learners connect abstract mathematical ideas with observable situations. Hinton and Flores (2019) found that the concrete-representational-abstract sequence can support learners who are at risk of mathematics failure. Flores and Hinton (2022) similarly demonstrated the usefulness of multiple representations in developing conceptual understanding among elementary learners.

Assessment is equally central to mathematics instruction. It should not be limited to determining grades after instruction. Rather, teachers can use assessment information to identify misconceptions, monitor progress, and adjust subsequent instruction. Black and Wiliam (1998) established the importance of formative assessment and feedback in improving classroom learning. More recent research confirms that formative assessment can support mathematics learning when it is implemented regularly, aligned with learning intentions, and connected to appropriate measures of student understanding (Formative Assessment in Mathematics Education, 2025).

Teacher preparation and continuing professional learning also influence the quality of mathematics instruction. Reston (2023) observed that the implementation of the Philippine K to 12 Mathematics curriculum created continuing demands for teacher development because teachers serve as major implementers of curriculum reform. In a more recent Philippine study, Banot (2025) found that elementary mathematics teachers demonstrated substantial preparedness in content, pedagogy, and assessment but continued to report professional development needs, particularly in assessment literacy and instructional innovation. International evidence also indicates that mathematics-focused professional development can positively influence student achievement (Park et al., 2025).

The local context remains important despite the growing body of national and international research. Conditions in one school district may differ from those in other educational settings. Availability of instructional materials, class size, teacher experience, supervisory support, professional development, and learner characteristics may shape how the Grade 4 Mathematics curriculum is implemented. Research on Philippine mathematics education has also identified persistent concerns involving foundational skills, instructional resources, curriculum implementation, and assessment practices (Banot, 2025; Barrot, 2023).

The present study is therefore anchored on the need to examine the actual implementation of Grade 4 Mathematics instruction from the viewpoint of teachers in public elementary schools in Gamu District. The study considers teachers' profiles, the realization of Mathematics 4 performance standards, instructional methods and strategies, instructional materials, assessment practices, administrative and supervisory support, and the difficulties encountered in teaching the subject. By examining these dimensions together, the study seeks to provide evidence that may guide appropriate school-level interventions, teacher support, and instructional improvement.

The study is primarily anchored in a constructivist view of learning, which regards learners as active participants in the construction of knowledge rather than passive recipients of information. Learning occurs as learners connect new experiences with existing knowledge and reorganize their understanding when they encounter new or more complex situations. The National Research Council (2000) emphasized that learners' prior knowledge strongly influences how they understand new concepts. In mathematics, this means that teachers need to identify learners' existing ideas and use them as a foundation for developing deeper mathematical understanding.

Constructivism is particularly relevant to mathematics instruction because mathematical concepts are not adequately developed through memorization alone. Learners need opportunities to represent ideas, investigate relationships, solve problems, discuss alternative solutions, and explain their reasoning. The National Research Council (2001) described mathematical proficiency as an integrated development of conceptual understanding, procedural fluency, strategic competence, adaptive reasoning, and productive disposition. These dimensions require classroom experiences in which learners actively engage with mathematical ideas.

NCTM (2014) similarly advocates teaching practices that support productive struggle, reasoning, discourse, connections, and the use of representations. Hiebert and Grouws (2007) further argued that classroom teaching influences both the nature and level of students' mathematical learning. Thus, the teacher is not merely a transmitter of mathematical information. The teacher designs learning experiences, facilitates discussion, monitors understanding, provides feedback, and adjusts instruction according to learners' needs.

The framework also recognizes the importance of assessment and teacher support. Formative assessment provides information that can be used to determine whether learners understand the lesson and what instructional adjustments are necessary (Black & Wiliam, 1998). Likewise, sustained professional development can strengthen teachers' mathematical and pedagogical practices (Park et al., 2025). Administrative and supervisory support may therefore contribute to teachers' capacity to implement the curriculum effectively.

In this study, the teaching of Mathematics 4 is viewed as an interaction among teacher characteristics, curriculum expectations, instructional practices, learning resources, assessment practices, and school support. These elements provide the basis for examining the extent to which Mathematics 4 performance standards are realized and the difficulties teachers encounter in the process.

Instead of using the original figure, the framework may be stated textually as follows:

Teacher and instructional inputs → Implementation of Mathematics 4 instruction → Observed instructional outcomes and identified needs → Recommended interventions and support

The inputs include teachers' demographic and professional characteristics, Mathematics 4 performance standards, teaching methods and strategies, instructional materials, assessment tools, administrative support, and supervisory assistance. The implementation component covers classroom teaching practices, assessment, monitoring, and teacher-learner interaction. The resulting information is used to identify strengths, difficulties, and areas requiring intervention. The ultimate purpose is to strengthen the teaching of Mathematics 4 in public elementary schools in Gamu District.

This framework is consistent with the view that improvement in mathematics education requires attention not only to learners' outcomes but also to the quality of classroom instruction and the conditions that support teachers' work (Hattie, 2012; Stigler & Hiebert, 1999).

Statement of the problem

This study examined the teaching of Mathematics 4 from the viewpoint of teachers in public elementary schools in Gamu District. Specifically, it sought to answer the following questions:

1. What is the profile of the teachers teaching Mathematics 4 in the public elementary schools in Gamu District in terms of age, sex, civil status, highest educational attainment, latest performance rating, length of teaching experience, present position, and in service training attended in Mathematics?
2. What are the Mathematics 4 performance standards, and to what extent are these standards realized?
3. How is the teaching of Mathematics 4 described in terms of methods, techniques, strategies, and approaches, instructional materials, assessment tools, and administrative and supervisory support?
4. What difficulties or obstructions are encountered by teachers in teaching Mathematics 4, and to what extent are these experienced?

METHODOLOGY

The study employed the descriptive survey method to examine the teaching of Mathematics 4 in public elementary schools in Gamu District, Schools Division of Isabela. According to Good and Scates (1986), descriptive research is concerned with describing existing conditions and the characteristics of a particular group. Calmorin (1994) similarly explained that the method is appropriate when the researcher seeks to determine the extent to which particular conditions exist. Guba (1987) further noted that descriptive research is useful in examining what exists and the conditions surrounding it. Estolas (1973) described the approach as one that identifies prevailing practices, relationships, processes, and emerging trends.

The study was conducted in the public elementary schools of Gamu District, Schools Division of Isabela, during School Year 2025–2026. The respondents were Grade 4 teachers who taught Mathematics 4 in the district. The study covered 16 public elementary schools: Barcolan Elementary School, Buenavista Elementary School, Camp Melchor Elementary School, Dammao Elementary School, Furao Elementary School, Gamu Central School, Guibang Elementary School, Lenzon Elementary School, Linglingay Elementary School, Mabini Elementary School, Pintor Elementary School, Rizal Primary School, Sta. Rosa Elementary School, Union Elementary School, UPI Elementary School, and Song Song Elementary School. The respondent distribution in the manuscript totals 18 teachers, with two respondents from Gamu Central School and one respondent from each of the other 15 schools. Data were gathered primarily through a researcher-developed questionnaire, supplemented by an unstructured interview. The questionnaire was prepared following a review of related literature and studies. It consisted of seven parts covering the teachers' profile, realization of Mathematics 4 performance standards, teaching methods and strategies, instructional materials, assessment tools, administrative and supervisory support, and factors affecting the teaching of Mathematics 4. The questionnaire was pretested with Grade 4 Mathematics teachers from other districts in the Schools Division of Isabela who were not included in the study. The performance standards were excluded from the try-out because they were prescribed competencies of the Department of Education. Feedback obtained during the pretesting, together with recommendations from the researcher's adviser and the Dean of the Graduate Studies School, was incorporated into the final instrument.

An informal interview was also conducted to supplement and cross-check information obtained through the questionnaire. The interviews were conducted with randomly selected respondents during the administration and retrieval of the questionnaire. In the revised procedure, the questionnaire was distributed through an online link sent to the school heads, who informed the teachers about the study. The respondents accessed the questionnaire through the link and completed it according to the given instructions. Selected respondents were subsequently invited to participate in an informal interview through Google Meet. The collected data were tallied, organized, and analyzed statistically. Frequency and percentage were used to describe the respondents' profiles in terms of age, sex or gender, civil status, highest educational attainment, latest performance rating, length of teaching experience, present position, and Mathematics-related in-service training. Weighted mean was used to determine the extent of realization of the Mathematics 4 performance standards and to assess the teaching methods, techniques, strategies and approaches, instructional materials, assessment tools, administrative support, supervisory support, and difficulties encountered by the respondents. Pagoso et al. (1992) served as the cited reference for the use of weighted mean in the treatment of the data.

The study obtained permission from the Schools Division Superintendent of the Schools Division of Isabela before the conduct of the research. Data gathering proceeded after the necessary authorization was secured. The questionnaire was then administered to the identified teacher-respondents, followed by the supplemental interviews.

RESULTS AND DISCUSSION

The study involved 17 Grade 4 Mathematics teachers from public elementary schools in Gamu District. The findings showed that the Mathematics 4 performance standards were generally realized, with a grand weighted mean of 4.17. Realization was highest in the first quarter (4.24) and gradually declined through the fourth quarter (4.10). Although the standards remained generally realized, the decline suggests that teachers may encounter greater challenges as competencies become more complex and cumulative.

Teachers rated their methods, techniques, strategies, and approaches to Mathematics 4 as very effective, with weighted means ranging from 4.25 to 4.29. Learner-centered teaching (4.33), explicit instruction (4.37), and connecting mathematics with other learning areas (4.32) were among the highest-rated practices. These findings indicate that teachers use varied approaches rather than depending on a single instructional method. Such practices are consistent with the view that effective mathematics teaching should develop conceptual understanding, reasoning, problem-solving, and meaningful mathematical engagement (Hiebert & Grouws, 2007; National Council of Teachers of Mathematics [NCTM], 2014).

The use of instructional materials was also rated very effective (4.29), with visual materials receiving the highest rating (4.35). This suggests that teachers recognize the value of representations in helping elementary learners understand mathematical concepts. The finding is consistent with research showing that concrete and visual representations can support the transition from intuitive understanding to abstract mathematical thinking (Hinton & Flores, 2019).

Assessment practices were similarly rated very effective (4.27). Quarterly assessments received the highest rating (4.30), followed by performance tasks (4.27) and written works (4.25). The results indicate that teachers use both conventional and performance-based assessment. This is important because assessment can provide evidence not only of what learners have remembered but also of how they apply mathematical knowledge. Black and Wiliam (1998) emphasized that assessment is most valuable when evidence of learning informs subsequent instruction.

Administrative support obtained a weighted mean of 4.23, while supervisory support received 4.33, both interpreted as very effective. Classroom observation (4.40) and lesson planning and delivery support (4.37) were particularly strong. These results suggest that teachers generally perceive school leadership and supervision as supportive of instructional work. Such support may help sustain effective classroom practices and address instructional concerns.

Despite these strengths, teachers reported moderate difficulties in teaching Mathematics 4, with an overall weighted mean of 3.18. Pedagogical factors were the most difficult (3.39), followed by learner factors (3.37), parent factors (3.35), school factors (3.12), and teacher factors (2.67). The most prominent difficulty was addressing learners' different needs (3.49). Other concerns included prior knowledge, fear of mathematics, large class size, financial constraints, and internet connectivity.

The findings suggest that the major challenge is not the absence of effective instructional practices but the difficulty of adapting those practices to diverse learner needs and contextual constraints. Learners' prior knowledge is particularly important because existing understanding influences how new mathematical concepts are acquired (National Research

Council, 2000). Similarly, differentiated instruction requires teachers to adjust content, processes, and activities according to learner differences (Magayon & Tan, 2020).

Overall, the results indicate that Mathematics 4 teaching in Gamu District is characterized by generally strong curriculum implementation, varied instructional practices, appropriate use of learning resources and assessment, and substantial administrative and supervisory support. However, these strengths are accompanied by persistent challenges related to learner diversity, foundational knowledge, class size, family circumstances, and instructional resources. The findings therefore point to the need for sustained professional development, targeted remediation, differentiated instruction, and continued school-level support to strengthen Mathematics 4 instruction.

CONCLUSION

The study concludes that the teacher-respondents were relatively young, predominantly female, married, educationally qualified, and had outstanding performance ratings. They also had considerable teaching experience and had attended various levels of in-service training. These characteristics suggest that the respondents possessed adequate professional preparation and practical experience to teach Mathematics 4.

The Mathematics 4 performance standards were generally realized. The methods, techniques, strategies, and approaches used by the teachers were assessed as very effective. Likewise, the instructional materials were considered adequate and effective, while the evaluative tools used to measure pupils' performance were rated very effective. These findings indicate that teachers generally had the instructional resources and assessment practices needed to support the teaching and learning of Mathematics 4.

Administrative and supervisory support was also assessed as very effective. This indicates that teachers received substantial assistance from school administrators and supervisors in carrying out their instructional responsibilities. Such support should be sustained through regular instructional guidance, classroom observation, constructive feedback, and opportunities for continuing professional development in mathematics.

Although several factors affected the teaching of Mathematics 4, these were generally considered manageable. The findings point to the importance of addressing learner differences, strengthening pupils' prior knowledge, and providing appropriate instructional support. Teachers may account for pupils' strengths and use schema-based instruction to connect new mathematical concepts with what learners already know. Peer tutoring may also be encouraged to provide pupils with opportunities to learn from and support one another.

Teachers should establish clear mathematics learning goals and use multiple representations, including diagrams, charts, pictures, and concrete manipulatives, to make abstract concepts easier to understand. Formative assessment should be used regularly through short activities, questioning, and other classroom checks. These practices can help teachers identify misconceptions early and provide timely support.

Differentiated instruction is also recommended because pupils differ in readiness, interests, and learning needs. A variety of activities and materials can help teachers respond to these differences. At the same time, teachers should be encouraged to balance traditional and modern teaching approaches. Traditional methods can provide structure and clarity, while learner-centered and technology-supported strategies can increase participation and engagement. Appropriate training, resources, and institutional support are necessary for this balanced approach.

Parental involvement should likewise be strengthened. Teachers and parents may provide consistent encouragement to pupils, particularly in completing learning tasks and sustaining effort. Positive reinforcement can help address inconsistent parental support and encourage pupils to persevere in mathematics.

For large classes, teachers may employ flexible grouping, peer teaching, chunking of lessons, clear classroom routines, and interactive strategies such as Think-Pair-Share and group discussions. These practices can make classroom management more manageable while providing pupils with greater opportunities to participate and receive feedback.

Finally, continuing professional development should remain a priority. Teachers need sustained opportunities to improve their knowledge of mathematics content, instructional strategies, assessment, differentiation, and the appropriate use of modern educational resources. Future researchers may conduct similar studies using other variables, larger samples, or different educational contexts to further examine factors influencing the teaching of Mathematics 4 and to develop evidence-based interventions for improving mathematics instruction.

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