JOURNAL
OF EDUCATIONAL RESEARCH, INNOVATION, AND MULTIDISCIPLINARY STUDIES
An Academic Journal Publication
Website: | https://jerimspublication.com
INTERNATIONAL STANDARD SERIAL NUMBERS
PRINT ISSN 3116-5559
ONLINE ISSN 3116-5567
Volume 1, Issue 8, pp 41-47, October 2026

Research Article

Navigating Diversity of Key Stage 2 Classrooms: Teachers' Approaches to Problem Solving

Felsan C. Legaspi
Department of Education

Article History:

Submission: August, 2026
Revised: September, 2026
Accepted: September, 2026
Published: October, 2026

Originality: 96%
Similarity Index: 6%
Grammarly Score: 97%

*Corresponding Author:
felsan.cagula@deped.gov.ph

Recommended Citation:

Legaspi, F., (2026). Navigating Diversity of Key Stage 2 Classrooms: Teachers' Approaches to Problem Solving. *Journal of Educational Research, Innovation, and Multidisciplinary Studies, 1(8), 41-47.*

https://doi.org/10.67001/jeri.2026.01.G4Q2XN

ABSTRACT

This study explored how Key Stage 2 Mathematics teachers navigated learner diversity in problem-solving instruction in Sinacaban District, Division of Misamis Occidental, during School Year 2025–2026. Using a qualitative phenomenological design, the researcher gathered accounts from 15 permanent public-school teachers handling Grades 4–6 Mathematics through in-depth interviews. The findings identified wide differences in learner readiness, foundational numeracy, reading comprehension, confidence, and language proficiency, alongside difficulties in pacing and engagement. Teachers responded through differentiated and inclusive instruction, collaborative learning, contextualized tasks, responsive teaching, and explicit strategy instruction. Six problem-solving strategy groups emerged: visual and representational methods, heuristic and analytical approaches, structured frameworks, cognitive modeling, differentiated scaffolding, and collaborative problem solving. These findings underscore the importance of adaptive instruction and socially supported learning in addressing heterogeneous classroom needs.

Keywords: *collaborative learning; differentiated instruction; learner diversity; problem-solving strategies; social constructivism.*

Copyright Notice:

2026 Author(s). This is an Open Access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC-BY 4.0: https://creativecommons.org/licenses/by/4.0/), allowing third parties to copy and redistribute the material in any medium or format and to remix, transform, and build upon the material for any purpose, even commercially, provided the original work is properly cited and states its license.

Introduction

Problem solving is central to Mathematics learning in Key Stage 2 (Grades 4–6), when pupils are expected to connect foundational numeracy with increasingly complex reasoning and word problems. Yet classroom diversity complicates this process: learners differ in prior knowledge, reading comprehension, language proficiency, confidence, learning pace, and access to support. A single instructional approach may therefore leave some pupils behind while providing insufficient challenge to others. Differentiated, contextualized, and collaborative instruction offers potential ways of responding to these differences (Cagapea et al., 2023; Cambaya & Tan, 2022).

In the Philippine public-school context, teachers are expected to develop learners' critical thinking and mathematical problem-solving competencies while responding to varied educational needs. The thesis identifies local concerns regarding Mathematics performance in Misamis Occidental and the practical constraints associated with mixed-readiness classrooms. These challenges suggest that understanding how teachers make instructional decisions is as important as documenting the strategies themselves.

Social Constructivist Theory (Vygotsky, 1978) provides the principal lens for this study. Learning develops through interaction, guided participation, and scaffolding within the Zone of Proximal Development. Bandura's Social Cognitive Theory also informs the interpretation of teachers' professional agency and self-efficacy as they adjust their practice to learners' needs. Together, these perspectives highlight the relationship between instructional support, teacher decision-making, and opportunities for collaborative mathematical reasoning.

Previous research has discussed differentiated instruction, problem-based learning, contextualization, and collaborative problem solving (Andrade et al., 2021; Benedicto & Andrade, 2022; Xu et al., 2023). However, the experiences of Key Stage 2 Mathematics teachers who manage these approaches simultaneously in heterogeneous district classrooms remain important to document. Local accounts can clarify the adaptations teachers consider feasible and the barriers they encounter.

Accordingly, this study examined the lived experiences of Key Stage 2 teachers in handling learner diversity, their approaches and coping mechanisms in teaching and managing diverse learners, and the problem-solving strategies they employed. The inquiry focused on permanent public-school Mathematics teachers in Sinacaban District, Division of Misamis Occidental, during School Year 2025–2026.

Methods

The study employed a qualitative phenomenological design to explore the lived experiences of 15 purposively selected permanent public-school teachers handling Grades 4–6 Mathematics in Sinacaban District, Misamis Occidental, during School Year 2025–2026. Data were collected primarily through validated semi-structured, in-depth interviews, supplemented by classroom observations and review of instructional documents as described in the thesis. Following institutional and school-level permissions, participants provided informed consent, and interviews were recorded with permission and transcribed. The researcher used Braun and Clarke's six-phase thematic analysis to identify and refine patterns across the accounts, with member checking and triangulation to strengthen credibility. Participation was voluntary, identifying information was protected, and data handling followed the Data Privacy Act of 2012 (Republic Act No. 10173).

Results and Discussions

Teachers' Lived Experiences in Handling Learner Diversity

Themes	Sub-Themes
Diverse Learner Profiles and Readiness Levels	Wide Range of Learner Abilities; Mixed Levels of Numeracy Skills; Varied Learning Pace and Styles; Differences in Confidence and Background
Learning Gaps and Academic Challenges	Difficulty in Problem-Solving Skills; Struggles in Reading Comprehension; Limited Foundational Skills; Language Barriers in Understanding Problems

Instructional Adaptation and Differentiation	Need for Differentiated Instruction; Use of Scaffolding Strategies; Flexible Grouping and Tiered Activities; Multiple Teaching Approaches
Instructional Challenges in Diverse Classrooms	Difficulty Balancing Learner Needs; Time Constraints; Managing Fast and Slow Learners Simultaneously; Maintaining Student Engagement
Opportunities from Learner Diversity	Peer Teaching and Collaboration; Shared Learning Experiences; Exchange of Ideas Among Learners; Development of Social and Cognitive Skills
Contextualized and Meaningful Learning	Use of Real-Life Contexts; Application to Daily Life Situations; Use of Local Examples; Increased Student Engagement Through Context

The findings revealed that teachers experienced significant challenges in addressing learner diversity, particularly in managing varying levels of mathematical readiness, learning gaps, and instructional needs. Participants described classrooms consisting of learners who could independently solve complex mathematical problems and others who continued to struggle with basic numeracy skills. Difficulties in reading comprehension, problem-solving, and understanding mathematical language further complicated instructional delivery. Consequently, teachers employed differentiated instruction, flexible grouping, scaffolding, and individualized support to accommodate diverse learning abilities. However, limited instructional time and the simultaneous management of learners with different proficiency levels created additional classroom management and planning challenges. These findings are supported by Tomlinson (2014), who emphasized the importance of differentiated instruction in addressing learners' varying readiness levels, and Vygotsky (1978), who highlighted the role of scaffolding and guided assistance in promoting cognitive development.

Despite these challenges, teachers recognized learner diversity as an opportunity to promote collaborative learning, peer interaction, and meaningful mathematical experiences. Through peer teaching, cooperative activities, and contextualized instruction, learners were encouraged to exchange ideas, explore different problem-solving approaches, and connect mathematical concepts with familiar real-life situations. One teacher described a classroom in which some learners could mentally solve complex word problems while others still relied on finger counting for basic addition, illustrating the need to balance remediation, enrichment, and instructional pacing. Boaler (2016) emphasized that collaborative mathematical learning encourages conceptual understanding and active participation, while Clements and Sarama (2014) highlighted the importance of developmentally appropriate mathematical instruction. Similarly, Ladson-Billings (1995) underscored the value of connecting learning experiences with learners' cultural and everyday contexts. Overall, the findings suggest that effective Mathematics instruction in diverse classrooms requires pedagogical flexibility, inclusive teaching practices, collaborative learning opportunities, and contextualized activities that respond to individual learning needs while promoting equitable participation and mathematical understanding.

2. Teachers' Approaches to Teaching and Managing Diverse Learners

Themes	Sub-Themes
Differentiation and Inclusive Teaching Practices	Differentiated Instruction; Tiered Activities; Flexible Grouping; Scaffolding Strategies
Collaborative Learning Strategies	Use of Group Work and Peer Teaching; Mixed-Ability Grouping; Peer Mentoring; Think-Pair-Share / Jigsaw Activities
Contextualized and Experiential Learning	Use of Real-Life Problems; Application to Daily Life Situations; Localized Examples; Concrete-Pictorial-Abstract Approach

Responsive and Adaptive Teaching	Continuous Assessment and Observation; Questioning Techniques; Immediate Feedback and Adjustment; Monitoring Student Progress
Explicit Teaching of Strategies	Modeling Problem-Solving Strategies; Step-by-Step Demonstration; Use of Heuristics (diagram, tables, etc.); Guided Practice

The findings revealed that teachers employed various instructional approaches to address the diverse learning needs, abilities, and mathematical readiness levels of learners. These approaches included differentiated and inclusive teaching practices, collaborative learning strategies, contextualized and experiential learning, responsive and adaptive teaching, and explicit instruction in mathematical problem-solving. Teachers utilized tiered activities, flexible grouping, and scaffolding strategies to provide appropriate learning opportunities while maintaining common instructional objectives. Collaborative activities, such as peer mentoring, mixed-ability grouping, and think-pair-share, encouraged learners to exchange ideas, explain mathematical concepts, and develop problem-solving skills through social interaction. Moreover, teachers integrated real-life situations, localized examples, and concrete–pictorial–abstract representations to make mathematical concepts more accessible and meaningful. These findings are supported by Tomlinson (2014), who emphasized differentiated instruction as an effective approach to addressing varying learner readiness levels, and Vygotsky (1978), who highlighted the importance of social interaction, scaffolding, and collaborative learning in cognitive development. Similarly, Boaler (2016) emphasized that collaborative mathematical activities and multiple representations provide opportunities for learners to develop conceptual understanding and mathematical reasoning.

Furthermore, teachers demonstrated responsive and adaptive instructional practices through continuous assessment, classroom observation, questioning techniques, immediate feedback, and regular monitoring of learner progress. These strategies enabled teachers to identify learning difficulties and make timely adjustments to instructional pacing, learning activities, and individualized assistance. Explicit teaching strategies, including step-by-step demonstrations, modeling of mathematical procedures, worked examples, heuristic techniques, and guided practice, were also utilized to strengthen learners' understanding of mathematical concepts and problem-solving processes. Black and Wiliam (1998) emphasized the importance of formative assessment and feedback in improving classroom instruction and supporting learner progress, while Rosenshine (2012) highlighted the effectiveness of explicit instruction, teacher modeling, guided practice, and systematic questioning in facilitating learning. Additionally, Hattie and Timperley (2007) explained that meaningful feedback helps learners understand their current performance and identify appropriate steps toward achieving learning goals. Overall, the findings suggest that teachers' approaches to managing learner diversity involve the integration of differentiated instruction, collaborative learning, contextualized activities, formative assessment, and explicit teaching strategies. These interconnected practices reflect teachers' instructional flexibility and commitment to creating inclusive Mathematics classrooms that accommodate individual differences and promote meaningful learning experiences.

3. Problem-Solving Strategies for Diverse Learners

Themes	Sub-Themes
Visual and Representational Strategies	Drawing Models and Diagrams; Use of Tables and Patterns; Concrete–Pictorial–Abstract (CPA) Approach; Use of Real Objects and Manipulatives
Heuristic and Analytical Problem-Solving Strategies	Guess and Check Method; Working Backwards; Identifying Patterns; Step-by-Step Problem Solving
Structured Problem-Solving Frameworks	Teaching Polya's Method (Understand–Plan–Solve–Check); Guided Questioning; Identifying Given and Needed Information; Reflecting and Checking Answers
Explicit Instruction and Cognitive Modeling	Modeling Strategies (Think-Aloud); Demonstrating Multiple Strategies; Explaining

	Reasoning Processes; Scaffolding Student Thinking
Differentiated and Scaffolded Support	Breaking Problems into Smaller Steps; Providing Guided Practice; Use of Visual Aids and Supports; Small Group or One-on-One Support
Collaborative Problem-Solving Approaches	Peer Teaching and Explanation; Mixed-Ability Grouping; Student Explanation of Strategies; Learning Through Discussion

The findings revealed that teachers employed various problem-solving strategies to address learners' diverse mathematical abilities, learning needs, and levels of understanding. These strategies included visual and representational approaches, heuristic and analytical techniques, structured problem-solving frameworks, explicit instruction and cognitive modeling, differentiated and scaffolded support, and collaborative problem-solving activities. Teachers utilized diagrams, bar models, number lines, tables, manipulatives, and the concrete–pictorial–abstract approach to help learners visualize mathematical relationships and understand abstract concepts. Additionally, heuristic strategies such as guess-and-check, working backward, identifying patterns, and step-by-step reasoning provided learners with alternative approaches to solving mathematical problems. One participant emphasized the importance of visualization by stating, “If you cannot solve it, draw it,” while another identified “drawing diagrams, looking for patterns, and working backwards” as preferred strategies (P5). These findings are supported by Polya (1945), who emphasized the importance of systematic problem-solving processes involving understanding the problem, devising a plan, carrying out the plan, and looking back to evaluate the solution. Similarly, Clements and Sarama (2014) highlighted the importance of concrete materials and visual representations in developing mathematical understanding, while Schoenfeld (1985) emphasized the role of heuristic strategies and mathematical reasoning in solving unfamiliar problems.

Furthermore, teachers implemented explicit instruction, cognitive modeling, guided questioning, and differentiated support to strengthen learners' mathematical problem-solving competencies. Through think-aloud demonstrations, worked examples, and guided practice, teachers made their reasoning processes visible and helped learners understand how mathematical strategies could be applied systematically. Complex problems were broken into manageable steps, while small-group instruction, individualized assistance, and peer collaboration provided additional learning opportunities for pupils requiring greater support. These practices are consistent with Rosenshine (2012), who emphasized the importance of teacher modeling, guided practice, questioning, and gradual instructional support in facilitating effective learning. Likewise, Vygotsky (1978) explained that learners develop higher cognitive abilities through guided interaction and assistance from more knowledgeable individuals. Slavin (2014) further highlighted the potential of cooperative learning to support academic achievement through structured peer interaction and shared learning responsibilities. Overall, the findings suggest that effective mathematical problem-solving instruction for diverse learners requires the integration of multiple representations, structured reasoning processes, explicit teaching, differentiated scaffolding, and collaborative learning. These interconnected strategies provide learners with varied opportunities to develop mathematical understanding, strengthen critical thinking, and become more independent and confident problem solvers.

Conclusions

Key Stage 2 Mathematics teachers in Sinacaban District experienced substantial learner diversity in readiness, numeracy, comprehension, language, pace, and confidence. Their responses involved ongoing instructional adaptation rather than a single uniform method. Differentiated instruction, collaborative learning, contextualized tasks, formative assessment, explicit modeling, visual representations, structured heuristics, and scaffolding emerged as complementary practices. The findings support a social constructivist understanding of problem-solving instruction in which teacher guidance and peer interaction help learners participate at different levels. Because the study is qualitative and district-specific, its findings illuminate reported practice rather than establish causal effects on achievement.

Recommendations

Schools and district leaders may strengthen Key Stage 2 Mathematics instruction by providing targeted

professional development in differentiation, mathematical discourse, concrete–pictorial–abstract teaching, formative assessment, and Polya-based problem-solving routines. Learning Action Cell sessions may be used to share locally effective lesson designs and strategies for mixed-readiness classes. Administrators should support access to manipulatives, contextualized materials, and collaborative planning time, while teachers may combine flexible grouping, guided practice, and peer explanation to respond to learner needs. Future studies may observe classroom implementation and examine learners' outcomes across additional districts to extend the present qualitative findings.

Conflict of Interests

The author declares no conflict of interest.

References

[1] Andrade, R. R., Fortes, E. C., & Mabilangan, R. A. (2021). Problem solving heuristics and mathematical abilities of heterogeneous learners. Universal Journal of Educational Research, 8(11), 5114-5126. https://www.academia.edu/download/110519998/UJER11-19516878.pdf

[2] Benedicto, P. N., & Andrade, R. (2022). Problem-based learning strategies and critical thinking skills among pre-service teachers. International Journal of Science, Technology, Engineering and Mathematics, 2(2). https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4190124

[3] Black, P., & Wiliam, D. (1998). Assessment and classroom learning. Assessment in Education: Principles, Policy & Practice, 5(1), 7–74. https://doi.org/10.1080/0969595980050102

[4] Boaler, J. (2016). Mathematical mindsets: Unleashing students' potential through creative mathematics, inspiring messages and innovative teaching. Jossey-Bass.

[5] Cagapea, W. E., Bataob, H. S., Atilloc, F. F., Tampusd, M. G. M., But-aye, C. T., & Malnegrof, J. (2023). Differentiated Instruction Practices: A Disclosure of Receiving Teachers. International Journal of Research Publications, 127(1), 255-275. https://www.researchgate.net/profile/Wenefredo-Cagape/publication/371901625_Differentiated_Instruction_Practices_A_Disclosure_of_Receiving_Teachers/links/654a0421ce88b87031d1a3c1/Differentiated-Instruction-Practices-A-Disclosure-of-Receiving-Teachers.pdf

[6] Cambaya, E. J., & Tan, D. A. (2022). Enhancing students' problem-solving skills and engagement in mathematics learning through contextualized instruction. Sci. Int.(Lahore), 34(2), 101-109. https://www.researchgate.net/profile/Denis-Tan/publication/359437542_ENHANCING_STUDENTS'_PROBLEM-SOLVING_SKILLS_AND_ENGAGEMENT_IN_MATHEMATICS_LEARNING_THROUGH_CONTEXTUALIZED_INSTRUCTION/links/623c1e78f559847a6614a153/ENHANCING-STUDENTS-PROBLEM-SOLVING-SKILLS-AND-ENGAGEMENT-IN-MATHEMATICS-LEARNING-THROUGH-CONTEXTUALIZED-INSTRUCTION.pdf

[7] Clements, D. H., & Sarama, J. (2014). Learning and teaching early math: The learning trajectories approach (2nd ed.). Routledge. [https://doi.org/10.4324/9780203520574]

[8] Hattie, J., & Timperley, H. (2007). The power of feedback. Review of Educational Research, 77(1), 81–112. https://doi.org/10.3102/003465430298487

[9] Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. American Educational Research Journal, 32(3), 465–491. [https://doi.org/10.3102/00028312032003465]

[10] Polya, G. (1945). How to solve it: A new aspect of mathematical method. Princeton University Press.

[11] Rosenshine, B. (2012). Principles of instruction: Research-based strategies that all teachers should know. American Educator, 36(1), 12–19, 39.

[12] Schoenfeld, A. H. (1985). Mathematical problem solving. Academic Press.

[13] Slavin, R. E. (2014). Cooperative learning and academic achievement: Why does groupwork work? Anales de Psicología, 30(3), 785–791. https://doi.org/10.6018/analesps.30.3.201201

[14] Tomlinson, C. A. (2014). The differentiated classroom: Responding to the needs of all learners (2nd ed.). ASCD.

[15] Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. Harvard University Press.

[16] Xu, E., Wang, W., & Wang, Q. (2023). The effectiveness of collaborative problem solving in promoting students' critical thinking: A meta-analysis based on empirical literature. Humanities and Social Sciences Communications, 10(1), 1-11. https://www.nature.com/articles/s41599-023-01508-1