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Polya-Based Problem-Solving Instruction in Grade 3 Mathematics: Practices, Learner Responses, and Challenges

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***Abstract*—** This study examined Polya-based problem-solving instruction in Grade 3 Mathematics through teachers' assessments of instructional effectiveness, classroom practices, observations of learner responses, and implementation challenges. A quantitative descriptive-survey design was employed at Sorsogon East Central School, Philippines, involving ten purposively selected Mathematics teachers during School Year 2026–2027. Data were obtained through a researcher-prepared questionnaire and analyzed using weighted means, frequencies, and ranks. Teachers rated the instructional guide highly effective (overall weighted mean = 4.59) and reported always employing Polya-aligned practices (overall weighted mean = 3.94). All ten respondents observed learners understanding word problems, applying solutions, and following Polya-based procedures; nine reported several other favorable problem-solving behaviors. Time constraints ranked first among teacher-related implementation challenges, while learner inattentiveness ranked first among learner-related challenges. Based on the findings, an enhanced instructional package organized around the ILAW framework—Intentions, Learning Experiences, Assessment, and Ways Forward—was developed with ten illustrated learning activity sheets. The results indicate favorable teacher perceptions and observations of structured problem-solving instruction while highlighting practical barriers requiring adaptation, differentiation, and instructional support. As evidence was collected from teachers without direct learner testing or comparison groups, findings should not be interpreted as causal gains in student achievement.

***Keywords*—** Polya problem-solving approach; Grade 3 Mathematics; instructional practices; learner responses; implementation challenges.

I. INTRODUCTION

Mathematical problem-solving is a foundational competence in elementary education because it requires pupils to interpret situations, represent relationships among quantities, select operations, justify procedures, and evaluate results. Word problems are especially demanding for young learners: success depends not only on computation but also on language comprehension, strategic planning, and recognition of mathematical structures. Research associates children's word-problem performance with reading and oral language skills, cognitive demands, and task characteristics (Fuchs et al., 2018; Hickendorff, 2021; Arsenault & Powell, 2022; King & Powell, 2023). Consequently, instruction that emphasizes only numerical answers may fail to address the reasoning required to reach them.

Grade 3 is an important point for consolidating arithmetic and extending it to unfamiliar, context-rich situations. Learners increasingly encounter tasks that require them to distinguish relevant from irrelevant information and decide how a mathematical relationship can be modeled. An emphasis on key words alone can be misleading; mathematical structure and sense-making provide more dependable bases for operation selection (Powell, Namkung, & Lin, 2022). The design of classroom support therefore matters as much as the particular computations being practiced.

Polya's classic problem-solving heuristic offers a transparent instructional sequence: understand the problem, devise a plan, carry out the plan, and look back (Pólya, 1945). These stages invite learners to identify given and unknown information, choose a reasonable approach, execute it, and check or explain the result. The four-step sequence is not a substitute for mathematical content knowledge, but it can organize teacher prompts and learner reflection. Contemporary classroom work continues to apply Polya's stages to story problems and broader mathematical reasoning (Namgyal & Kongmanus, 2018; Yuwono, 2020; Novitasari et al., 2023; Fitriani, 2025).

Explicit and structured instruction is supported by a broader mathematics intervention literature. Schema-based approaches help children classify mathematical relationships and select strategies instead of guessing an operation from isolated words (Powell & Fuchs, 2018; Alghamdi et al., 2020). Reviews and meta-analyses report benefits from targeted

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mathematics and word-problem interventions, including for learners who experience mathematics difficulty (Jitendra et al., 2021; Myers et al., 2022). Such evidence motivates the examination of practical, teacher-usable supports, but it does not establish the effectiveness of any untested local guide.

Teachers are critical to translating a general problem-solving heuristic into specific classroom actions. Modeling, guided questioning, peer explanation, visual representations, and opportunities to check solutions can make pupils' reasoning visible. Teacher questioning may deepen explanation and mathematical discussion (DeJarnette et al., 2020; Johnny & Abdullah, 2020), while systematic visual models can make quantitative relationships easier to inspect (Jitendra & Woodward, 2019). These approaches align with scaffolding: assistance is deliberately provided and adjusted as pupils develop independence.

The amount and type of support also need to reflect differences in pupils' readiness, language resources, and mathematical understanding. Research on differentiated instruction suggests that adaptation is more likely to be beneficial when teachers can plan coherent instructional responses rather than merely divide pupils into groups (Deunk et al., 2018; Prast et al., 2018). Cognitive-load perspectives similarly favor clear sequencing and purposeful representations that reduce unnecessary complexity (Sweller et al., 2019). In ordinary classrooms, however, time for preparation, instructional resources, and diverse learner needs can constrain implementation.

A complementary element of structured problem-solving instruction is metacognition. The planning and looking-back stages require learners to monitor a strategy, consider whether an answer is reasonable, and explain how a solution was reached. Research on mathematical metacognition underscores the importance of prompts that invite monitoring and self-evaluation (Syahbrudin & Anggraini, 2019; William & Maat, 2020). These behaviors are particularly relevant in primary classrooms, where pupils may complete an algorithm without assessing whether the answer fits the problem situation.

The Philippine MATATAG Mathematics Curriculum emphasizes mathematical proficiency and reasoning (Department of Education, 2023). This commitment makes the practical implementation of structured instruction a pertinent local concern. National and regional discussions of mathematics learning reinforce the importance of ensuring that young learners are supported in developing problem-solving foundations; nevertheless, school-specific instructional issues require attention to classroom evidence rather than assumptions from broader assessments.

At Sorsogon East Central School, Grade 3 teachers identified difficulties related to pupils' interpretation of mathematical word problems and systematic solution procedures. The original thesis investigated how an existing Polya-Based Instructional Guide was evaluated and used by teachers and what learner behaviors they observed. It also examined barriers affecting its implementation and produced an enhanced guide organized through the ILAW framework. A locally grounded account of classroom practice is valuable because favorable perceptions of a guide can coexist with time pressures, differences in learner readiness, and limitations in teaching materials.

The present article therefore examines Polya-based problem-solving instruction in Grade 3 Mathematics by assessing teachers' perceived effectiveness of the guide, determining their reported instructional practices, describing teacher-observed learner responses and problem-solving performance, and identifying the challenges teachers and learners encountered. It focuses on the descriptive evidence in the original thesis and considers implications for improving the usability of Polya-aligned instructional materials; it does not claim experimentally demonstrated improvement in achievement.

Word-problem comprehension merits special attention because learners must translate written information into mathematical relations. A pupil may know how to add or divide yet remain uncertain whether the situation calls for that operation, especially when the wording contains distractors or the unknown appears in an unfamiliar position. Hickendorff (2021) and Arsenault and Powell (2022) show why the linguistic and structural characteristics of a task should be considered in interpreting performance. Within a Polya-based lesson, the teacher can address this challenge by asking what is known, what is required, and how quantities are connected before any computation begins. This emphasis preserves the reasoning demand of the task while making the steps more accessible.

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The four-step method also offers a common language for formative assessment. During the understanding phase, teachers may check whether pupils can restate a question in their own words. During planning, they may ask for a diagram or explanation of an operation choice. During execution, attention shifts to mathematical procedures, and during looking back, pupils can assess the plausibility of an answer. The process helps teachers notice which part of a solution is difficult, rather than treating all incorrect answers as the same kind of error. Such distinctions are important when deciding whether pupils need language support, a model, additional practice, or an opportunity to explain a strategy.

Implementation should nevertheless avoid reducing Polya's method to a rigid form completed mechanically. An instructional guide becomes educationally meaningful when teachers use its prompts to support reasoning across a variety of problems. For example, pupils may understand a narrative correctly but choose an inefficient operation, or perform a calculation accurately while misunderstanding what the result represents. A teacher can use the four stages flexibly to locate these difficulties. The "look back" stage should involve more than copying an answer into a sentence: it can include checking units, comparing the outcome with an estimate, or explaining why an answer is sensible in the context of the original situation.

The relationship between guide design and teaching workload is also significant. A detailed lesson plan can support consistency but may become difficult to use when teachers handle numerous tasks, limited materials, and pupils with varying learning needs. Practical instructional guides therefore benefit from concise prompts, ready-to-use examples, visual organizers, and alternative practice levels. These design considerations are not incidental conveniences. They determine whether the approach can be implemented routinely and whether teachers have enough time to elicit pupil explanations rather than merely complete prescribed activities.

Teachers' accounts are a useful starting point for understanding an instructional routine because they describe what practitioners perceive as workable, effective, and challenging. At the same time, evidence drawn from teachers alone captures a specific perspective. Learners may experience a task differently, and a pupil who appears engaged may still hold a misconception. For this reason, a descriptive survey can inform instructional development but cannot replace direct assessment of pupils' mathematical reasoning. The present publication retains that distinction as a guiding principle when interpreting favorable ratings and reported classroom observations.

II. METHODOLOGY

The study employed a quantitative descriptive-survey design to document how Polya-based problem-solving instruction was assessed and implemented in Grade 3 Mathematics at Sorsogon East Central School, Sorsogon City, Philippines. Ten Mathematics teachers who were involved in teaching Grade 3 and familiar with mathematical problem-solving were purposively selected during School Year 2026–2027. The unit of analysis was the teacher respondent; Grade 3 pupils were not directly surveyed or tested. This design was appropriate for describing perceptions, reported classroom practices, and observed learner behaviors, rather than establishing treatment effects.

Data were collected with a researcher-prepared questionnaire organized into four components. The first asked teachers to rate the guide's effectiveness across eight indicators using a five-point scale. The second measured the frequency of eight Polya-aligned teaching practices using a four-point scale. The third asked teachers to identify observed learner behaviors when the guide was used, and the fourth ranked five teacher-related and five learner-related implementation challenges. The instrument and reported procedures were drawn from the original thesis; no additional survey responses, direct learner assessments, or experimental comparisons were introduced for this article.

Descriptive statistics were applied according to the original analysis plan. Weighted means summarized teachers' effectiveness ratings and reported frequency of instructional practices; frequencies and ranks described observed learner responses; sums of ranks and overall rankings summarized teacher- and learner-related challenges. Results were organized around the four publication objectives and discussed alongside studies already cited in the thesis. Because the sample consisted of ten purposively selected teachers at one school, conclusions are context-specific and the measured effectiveness represents perceived—not causally demonstrated—effects on learning.

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III. RESULTS AND DISCUSSION

Teachers' assessment of perceived effectiveness

Table 1 summarizes teachers' ratings of the eight effectiveness indicators. The overall weighted mean of 4.59 was interpreted in the thesis as "Highly Effective." The highest-rated indicator concerned identifying important information and determining what was asked (4.70). Ratings for understanding problems, devising plans, performing procedures, checking answers, and reasoning were each 4.60, while confidence and independent problem-solving each received 4.50.

Table 1. *Teachers' Assessment of the Polya-Based Guide*

Indicators	Weighted Mean	Description
Helping pupils identify important information and determine what is being asked	4.70	Highly Effective
Helping pupils understand the given mathematical problem before solving	4.60	Highly Effective
Helping pupils develop appropriate strategies or plans for solving problems	4.60	Highly Effective
Improving pupils' ability to carry out solution procedures correctly	4.60	Highly Effective
Encouraging pupils to check and evaluate their answers	4.60	Highly Effective
Enhancing pupils' mathematical reasoning and critical thinking skills	4.60	Highly Effective
Increasing pupils' confidence in solving mathematical problems	4.50	Highly Effective
Promoting independent problem-solving among pupils	4.50	Highly Effective
Average	4.59	Highly Effective

These ratings indicate a consistently favorable assessment of the guide's role in supporting the problem-solving process. The pattern is conceptually consistent with explicit schema-based word-problem instruction, which emphasizes understanding quantitative relations before computation (Powell & Fuchs, 2018; Alghamdi et al., 2020). It also mirrors the four stages of Polya's approach: understanding the task, planning, implementing, and reviewing a solution. The relatively lower—but still highly favorable—ratings for confidence and independence suggest that reduced dependence on teacher assistance may require sustained scaffolding rather than a single instructional routine.

The term effectiveness must be read narrowly in this study. The scores represent teachers' judgments, not directly measured achievement gains. There were no learner pretests, posttests, comparison groups, or observations conducted by independent raters. Accordingly, the result provides useful implementation feedback but cannot quantify how much the guide changed pupils' mathematical proficiency.

Instructional practices used by teachers

Table 2 presents teachers' reported frequency of Polya-based practices. The overall weighted mean was 3.94, interpreted as "Always." Four practices received perfect mean ratings of 4.00: identifying given and required information, explaining solutions, reviewing and justifying answers, and using Polya-aligned questioning. Developing plans received the lowest mean of 3.80, while three other practices received 3.90.

Table 2. *Reported Polya-Aligned Instructional Practices*

Indicators	Weighted Mean	Description
Guiding pupils in identifying what is given and what is required in a mathematical problem	4.00	Always
Encouraging pupils to show and explain their solution procedures	4.00	Always

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Asking pupils to review, check, and justify their answers	4.00	Always
Using questioning techniques aligned with Polya's problem-solving steps	4.00	Always
Encouraging pupils to analyze the problem before selecting a solution strategy	3.90	Always
Providing opportunities for pupils to apply their chosen problem-solving strategies	3.90	Always
Providing learning activities that allow pupils to practice the four steps of Polya's method	3.90	Always
Guiding pupils in developing a plan or strategy to solve the mathematical problems	3.80	Always
Average	3.94	Always

The high frequency ratings suggest that teachers used the guide as a repeatable classroom routine. Asking pupils to explain and check their answers may strengthen visibility of mathematical reasoning, a feature also emphasized in research on productive mathematics questioning (DeJarnette et al., 2020; Johnny & Abdullah, 2020). The slight difference between routine checking and planning may warrant attention: selecting strategies involves recognizing problem structures and is often more demanding than following familiar steps.

Although teachers reported using the approach consistently, self-report measures do not reveal how deeply each practice was implemented, the amount of teacher scaffolding provided, or the quality of pupils' explanations. Future classroom observation may usefully distinguish procedural use of the four-step headings from substantive mathematical reasoning within each stage.

Teacher-observed learner responses and performance

Table 3 reports the number of teachers who observed eight learner behaviors. All ten respondents indicated that learners found word problems easier to understand, applied a solution, and consistently followed Polya-based procedures. Nine teachers reported each of the remaining behaviors: identifying unknowns, showing self-reliance, participating more actively, demonstrating motivation, and relying less on teacher assistance.

The observed pattern connects the instructional sequence to both cognitive and behavioral aspects of problem-solving. Teachers reported behaviors associated with comprehension and execution alongside participation, motivation, and independence. Such observations are consistent with arguments for structured representations and explicit problem-solving routines (Jitendra & Woodward, 2019; Powell & Fuchs, 2018), as well as metacognitive prompting that encourages monitoring and reflection (William & Maat, 2020).

Table 3. *Teacher-Observed Learner Responses*

Indicators	f	Rank
Learners find it easy to understand the word problem	10	2
Learners can easily apply a solution to the word problem	10	2
Learners consistently follow the procedures using Polya-Based principles	10	2
Learners easily find the unknown in the given word problem	9	6
Learners show self-reliance when solving word problems	9	6
Learners' participation increases when the Polya-Based Instructional Guide is used in problem-solving	9	6
Learners are motivated to solve word problems	9	6
Learners show less dependence on teachers' assistance	9	6

However, "ten" and "nine" are teacher frequencies, not counts of pupils demonstrating each behavior. Moreover, teachers were reporting classroom observations rather than independently scored learner work. Their favorable responses should therefore be understood as perceived classroom manifestations of the guide, not evidence of a verified rise in achievement. This limitation is particularly important when translating a thesis into a publication title that mentions learner responses.

Challenges encountered in implementation

Tables 4 and 5 distinguish teacher-related from learner-related barriers. Among teachers, time constraints ranked first (sum of ranks = 21), followed by difficulty using differentiated activities (26), limited preparation (29), insufficient instructional materials (30), and lack of instructional readiness (44). Among learners, inattentiveness ranked first (21),

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followed by confusion over operation selection (23), incomplete solutions (31), differences in competencies (37), and dependence on teacher assistance (39).

Table 4. *Teacher-Related Implementation Challenges*

Indicators	Sum of Ranks	Overall Rank
Time constraints	21	1
Difficulty in using differentiated activities	26	2
Limited preparation for the use of Polya-Based Instructional Guide for problem-solving	29	3
Lack of instructional materials	30	4
Lack of instructional readiness	44	5

Table 5. *Learner-Related Implementation Challenges*

Indicators	Sum of Ranks	Overall Rank
Learners' inattentiveness	21	1
Confusion about which operation to use	23	2
Incomplete solutions by the learner	31	3
Differences in learners' competencies	37	4
Dependence on teacher assistance	39	5

The rankings show that practical conditions can complicate the use of an approach that teachers otherwise rate favorably. Polya's stages involve substantial explanation, guided practice, and reflection, all of which require classroom time. Teachers also need prepared materials and differentiated tasks that accommodate varied pupil readiness. The findings accord with reviews showing that differentiation depends on deliberate lesson design, instructional support, and feasible classroom routines (Deunk et al., 2018; Prast et al., 2018).

Learners' inattentiveness and uncertainty about operations point to the demands of sustained reasoning. Explicit models and short guided prompts may reduce avoidable task complexity, while mathematical representations can help pupils focus on relationships between known and unknown quantities (Sweller et al., 2019; Jitendra & Woodward, 2019). Incomplete solutions and teacher dependence further support incorporating "look back" questions and opportunities for explanation rather than relying solely on completed numerical answers.

The sums of ranks reflect respondents' relative prioritization of obstacles rather than interval-scale estimates of severity. Thus, the figures identify areas for local instructional improvement but should not be treated as measures of the magnitude of each barrier. The small, single-school sample likewise limits generalization beyond the study setting.

Instructional enhancement: the ILAW-based guide

The thesis translated the combined findings into an enhanced Polya-Based Instructional Guide using the ILAW structure: Intentions, Learning Experiences, Assessment, and Ways Forward. Intentions define lesson goals; Learning Experiences organize instruction around understanding, planning, solving, and checking; Assessment provides evidence of pupil understanding; and Ways Forward specify remediation, enrichment, and subsequent teaching action. Ten teacher guides were paired with ten illustrated Learning Activity Sheets covering selected Grade 3 topics, including basic operations, money, time, fractions, measurement, perimeter, and data.

This package responds directly to the challenges described in Tables 4 and 5. Ready-to-use illustrations and contextualized tasks may reduce teachers' preparation demands, while differentiated practice and guided questions address variability in readiness and uncertainty about which operation to choose. Formative assessment and reflection create opportunities to identify incomplete reasoning and plan support. Evidence from mathematics formative-assessment research supports linking feedback and assessment to responsive instructional decisions (Chen et al., 2020; Maskos et al., 2025; Wisniewski et al., 2020).

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The enhancement was a development output of the descriptive study, not a separately evaluated treatment. Its instructional value is therefore a reasoned implication grounded in respondents' reported needs; usability, fidelity, and effects on learner outcomes require further study. A future implementation study could incorporate classroom observation, analysis of pupils' written solutions, and pretest–posttest or comparison-group designs, while documenting the extent to which teachers implement each ILAW component.

The four clusters of results should be read together rather than in isolation. High ratings for effectiveness and frequent use of instructional practices coexist with substantial time and attentional challenges. This combination is plausible: a teacher may value an approach and report using it regularly while still struggling to provide enough individualized support. The implications are therefore not that the guide should be replaced, but that its usability should be strengthened so the most important instructional actions can be carried out within ordinary lesson time. The proposed enhancement follows this logic by linking lesson intentions, learning experiences, assessment, and next-step decisions.

A second implication concerns the difference between procedural adherence and strategic understanding. Teachers frequently observed pupils following Polya-based procedures, yet confusion about operation selection was the second-ranked learner challenge. The coexistence of these findings suggests that the ability to proceed through a familiar sequence does not necessarily eliminate conceptual difficulty. When pupils are asked to devise a plan, instructional prompts should direct attention to relationships among quantities, not simply to a keyword or operation label. Word-problem research similarly cautions against shallow keyword matching and emphasizes mathematical schemas (Powell, Namkung, & Lin, 2022; Powell & Fuchs, 2018).

A third implication is the importance of making learner independence observable. Teachers rated confidence and independent problem-solving positively, but those indicators received the lowest effectiveness means in Table 1. They also reported that nine of ten observed reduced dependence on teacher help. This is a favorable pattern, although neither result specifies how often pupils completed work without prompts. Classroom documentation could more clearly distinguish independent responses, responses following general questioning, and responses requiring step-by-step modeling. Such evidence would help teachers gradually remove support without assuming that learners are ready to work independently in all problem types.

Assessment practices offer another way to connect the study's findings to routine improvement. The ILAW framework places assessment before "Ways Forward," creating a decision point at which teachers can provide remediation or enrichment. For instance, a pupil who misunderstands the text may benefit from a contextual illustration or oral restatement; a pupil who selects an incorrect operation may need comparison of problem structures; and a pupil who calculates correctly but gives an implausible answer may need additional looking-back prompts. Using the assessment result to select the next task is consistent with research that describes formative assessment as evidence gathering followed by responsive teaching (Chen et al., 2020; Maskos et al., 2025).

Several limitations should inform the interpretation and transfer of the study. Purposive selection of ten teachers restricts statistical generalizability, and the single-school setting limits conclusions about different school contexts. Self-reported frequency is vulnerable to differences in teachers' interpretations of the response categories, while teacher-observed learner behaviors may not capture the full range of pupil experiences. The analysis was descriptive, and no inferential test, direct learner outcome measure, or baseline comparison establishes the effectiveness of the guide as an intervention. These limitations do not invalidate the findings; they define the questions that the present data can reasonably answer.

Further work can build on the descriptive evidence through a staged evaluation of the enhanced instructional package. Initial usability studies could document whether teachers can complete ILAW lessons within the allocated time and whether differentiated activity sheets are accessible to pupils with varying abilities. Observation protocols could assess the quality of questioning and actual use of the four problem-solving stages. Subsequent studies could analyze pupil work and use common achievement measures to examine changes in comprehension, operation selection, and verification. This research progression would turn a promising, needs-responsive instructional output into a systematically evaluated educational resource.

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The teacher ratings also provide useful guidance about how instructional guides might be refined without overstating their capacity. The highest perceived-effectiveness indicator involved identifying information and recognizing what was being asked. This finding suggests that teachers particularly appreciated the clarity offered by a consistent entry point to a word problem. A practical revision might therefore preserve the introductory questions while offering a small number of alternative representations for pupils who still cannot parse the task. Such adaptations need not change the four-step framework; they can supply multiple ways to arrive at a meaningful understanding of the same mathematical relation.

The practices with ratings of 4.00 also illuminate the instructional routine most consistently reported by respondents. Teachers indicated that they prompted pupils to identify givens, explain procedures, review answers, and respond to questions aligned with Polya's steps. These behaviors collectively suggest an approach centered on articulation as well as computation. Yet the evidence does not show the accuracy or depth of pupil explanations. To move beyond frequency ratings, later studies could use short classroom transcripts or pupil solution samples to document whether explanations include mathematical relationships, whether pupils compare alternative strategies, and whether checking produces revisions to incorrect work.

For teachers, time constraints should be considered at the level of lesson design, not solely as a personal planning problem. A routine that asks every learner to discuss each stage at length may be difficult to complete in a typical Mathematics period. A more feasible design might distinguish core tasks from optional extensions, use brief whole-class modeling before guided practice, and provide teacher prompts that can be delivered efficiently. The ILAW structure offers a place to specify essential learning intentions and follow-up tasks, but its practical usefulness will depend on testing the amount of time required for implementation in real classrooms.

The learner-related rankings also suggest that different problems may require different kinds of differentiation. Inattentiveness may be addressed through manageable task length, visual clarity, and varied participation opportunities, whereas confusion about operations requires deliberate teaching of mathematical structures. Incomplete solutions may call for step-specific feedback, while dependence on teacher assistance may require fading prompts. A single undifferentiated worksheet may not meet all these needs. The enhanced activity sheets therefore have a clear rationale, but their effectiveness should be assessed in relation to each type of difficulty rather than assumed from their availability.

The findings have implications for school-level instructional leadership. Administrators can support consistent teaching practices by making space for collaborative lesson planning, sharing contextualized word problems, and organizing peer review of activity sheets. Teachers can examine which Polya prompts elicit meaningful responses and which produce rehearsed answers without clear understanding. Collaborative refinement can help keep the guide manageable and align it with curriculum expectations. Such support is especially important because the foremost barriers reported in this study involve time, differentiated activities, and preparation rather than disagreement with the instructional approach.

Finally, the descriptive character of the study creates a useful boundary for publication claims. A favorable mean score does not indicate that a program caused a particular improvement, and a teacher's observation that learners are motivated is not equivalent to a validated motivation scale. Similarly, summed rankings order respondents' concerns but do not reveal how much more serious one barrier is than another. A well-grounded interpretation keeps these distinctions visible while still recognizing the contribution of the research: it documents the implementation experience of Grade 3 teachers and provides an empirical rationale for refining a specific instructional guide in a particular school setting.

IV. CONCLUSION AND RECOMMENDATION

Conclusion

Teachers at Sorsogon East Central School assessed the Polya-Based Instructional Guide as highly effective (overall weighted mean = 4.59) and reported always applying Polya-aligned instructional practices (overall weighted mean = 3.94). They observed favorable learner responses related to understanding and solving word problems, following the four-step process, participation, motivation, and independence. At the same time, time constraints and learner inattentiveness were the leading implementation barriers, with differentiation, preparation, and operation selection also requiring attention. Together, the findings suggest that structured Polya-based instruction is viewed positively by the participating teachers but that its classroom use depends on feasible supports. Because the evidence comes from ten teachers' survey responses, it does not demonstrate causal improvements in pupils' mathematical achievement.

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Recommendation

School leaders and Mathematics teachers should strengthen the feasibility of Polya-based instruction by providing accessible, contextualized, and differentiated learning materials; protected planning time; routine problem-structure prompts; visual representations; and formative checking of pupils' reasoning. The thesis-derived ILAW guide and ten illustrated learning activity sheets offer a starting point for this work, particularly when accompanied by opportunities for teacher feedback and iterative refinement. Future researchers should assess implementation fidelity and usability across more schools and directly measure learner outcomes through appropriately designed assessments and, where feasible, comparison groups, so that perceived effectiveness can be tested against evidence of learning.

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