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Geometry Worksheets on Numeracy Skills of Grade 4 Learners

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Abstract
The study assessed the effect of the worksheets on students' performance in Dr. Antero M. Nazareno Elementary School, School Year 2024-2025. It specifically investigated the following: (1) the status of the numeracy skills of the students along: classify triangles and quadrilaterals, different quadrilaterals, perimeter of quadrilaterals that are not squares or rectangles, and perimeter of composite figures composed of triangles and quadrilaterals; (2) the design of the worksheet; (3) the curricular validity of the worksheet in terms of: Face, Content, and Construct (4) level of the numeracy skills the learners along the same aspects after the application of the developed worksheets; (5) the significant difference between before and after application of the worksheets; (6) the effectiveness of the worksheet. This study employed descriptive-comparative and research and development method. The data gathering tool used was researcher-made test and evaluation checklist were the tools used in this investigation. The statistical tools used were Mean, Standard Deviation, Performance Level, Weighted Mean, t-Test for dependent sample, and Cohen's D.

Keywords: Worksheets, Numeracy skills, Supplementary Materials

1. Introduction

In the modern educational landscape, the utilization of worksheets in mathematics serves as an important component within different settings. As educators strive to enhance student engagement and understanding of geometric concepts, worksheets serve as a versatile tool that can be tailored to meet diverse learning needs. Globally, there is a growing trend in integrating technology with traditional worksheets, allowing for interactive learning experiences that cater to different learning styles. Locally, educators are adapting these resources to address specific curriculum requirements and the unique challenges faced by their students.

Furthermore, numeracy skills are essential for students' overall academic success and everyday functioning, as they lay the foundation for future learning in mathematics and related subjects. Reports from various educational organizations indicate significant disparities in mathematics proficiency, with some regions struggling to equip learners with the basic skills needed to navigate an increasingly quantitative world. These global issues reflect a pressing need for targeted interventions and support systems to enhance numeracy education, particularly for young learners in foundational grades.

interaction between worksheets designed for Geometry and numeracy skills can present both opportunities and challenges in learners' development. When integrated effectively, worksheets can reinforce geometric concepts through numerical exercises, helping students develop a deeper understanding of shapes, measurements, and spatial reasoning while simultaneously strengthening their calculation skills. However, if these worksheets are not thoughtfully coordinated, they may lead to fragmented learning, where students struggle to see the connection between geometric concepts and numerical operations. Over-reliance on worksheets that focus solely on rote procedures can also hinder the development of critical thinking and problem-solving abilities.

Many learners worldwide face inequalities in access to quality INDICATE THE SOURCE resources, and worksheets serve as an essential tool to reinforce conceptual understanding outside the classroom. In Geometry, worksheets help students visualize shapes, understand spatial relationships, and develop problem-solving skills, which are vital for fostering critical thinking. Simultaneously, integrating numeracy skills within these worksheets encourages learners to strengthen their mathematical reasoning and computational abilities. However, disparities in access to such learning materials can widen educational gaps, especially in underserved regions.

Additionally, the Sustainable Development Goals (SDGs) emphasize the importance of providing inclusive and equitable quality education for all individuals (UN, 2015). This includes increasing access to free and quality education as well as ensuring that there are enough qualified teachers, particularly in developing countries stated in SGD 4 specifically says that:

Goal 4 aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. This goal supports the reduction of disparities and inequities in education, both in terms of access and quality. It recognizes the need to provide quality education for all, and most especially vulnerable populations, including poor children, children living in rural areas, persons with disabilities, indigenous people and refugee children.

Sustainable Development Goal 4 emphasizes the importance of ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all. Within this context, the use of worksheets in mathematics plays a crucial role in enhancing the numeracy skills of Grade 4 learners. Improved numeracy skills not only contribute to individual academic success but also align with SDG 4's goal of equipping young learners with the foundational skills needed to participate effectively in society and the economy.

According to Sakal et al. (2020) worksheets are important materials that enable students to organize their knowledge, including the steps of what the students need to do, and which ensure participation in the activity of the whole class at the same time. Mortensen and Smart (2020) identify worksheets as a strategy that allows them to control their own learning because it allows them to decide how and where to use the assigned tasks.

This is also aligned with the DepEd Order No. 24 series 2022 or The Basic Education Development Plan (BEDP) 2030. The Basic Education Development Plan (BEDP) 2030 of the Department of Education (DepEd) Philippines emphasizes numeracy as a critical component of foundational learning. It aims to strengthen mathematical competence among learners by improving curriculum relevance, enhancing teacher training, and ensuring equitable access to quality math education. BEDP 2030 also integrates innovative teaching strategies and assessment methods to address learning gaps and improve numeracy skills across different grade levels.

At the local level, schools are struggling with similar concerns as they strive to improve the numeracy skills of Grade 4 learners. In many communities, teachers face challenges such as large class sizes, insufficient materials, and varying levels of student readiness, which can hinder effective instruction. Additionally, some students may lack adequate support at home, further complicating their ability to grasp core mathematical concepts.

Likewise, according to Cabral (2024), numeracy is a person's literacy in Mathematics. It is one's ability to understand and work with numbers. It involves the person's capability to reason out and understand simple mathematical concepts. Assessing the numeracy skills of learners is vital in understanding how their learnings in Mathematics are developing, what mathematical knowledge these learners need to improve and what aids the teachers can give them. According to her, assessing the numeracy skills of learners is vital in understanding how their learnings in Mathematics are developing, what mathematical knowledge the learners need to improve and what aids the teachers can give them.
The researcher conducted a study on the effects of mathematics worksheets on the numeracy skills of Grade 4 learners due to several compelling reasons. Firstly, the significant emphasis on standardized testing and assessment in schools has led to an increased reliance on worksheets as a primary means of reinforcing mathematical concepts. However, the effectiveness of this approach has been questioned, with some studies suggesting that worksheets may not adequately promote deep understanding and problem-solving skills in students. Furthermore, the researcher noted that many Grade 4 learners are struggling with numeracy skills, particularly in Geometry which was revealed in the Albay Numeracy Assessment Tool (ALNAT) result wherein learners need major support. This is a critical concern, as research has shown that early numeracy skills are strongly predictive of future academic success. Additionally, the researcher was motivated by the need to identify effective interventions that can be implemented in resource-constrained educational settings, where access to technology and other instructional materials may be limited.

2. Theoretical Framework

Several theories related to the present investigation covered all topics presented. These theories were beneficial to the present study in achieving its goal which is shown in Figure 1. Further, theories helped the result of the study as a support to its claims. The main theory employed in this study was Bruner's Scaffolding Theory cited by Piamsai (2020), and supported by Merrill's Instructional Design Theory cited by An (2021), and Walberg's Theory on Performance cited by Everist (2023).

The main theory employed in the current study was Bruner's Scaffolding Theory. According to Bruner, scaffolding is a social process to support learners with an aim towards helping their future independence. Scaffolding is temporary, specific, meaningful, and interactive. It is a social interaction between the knowledgeable and the novice. Through the interaction, the knowledgeable provides support to the novice. In the educational setting, scaffolding is the process

involving teachers' temporary assistance and guidance at the beginning of the class so that learners can later develop their knowledge and skills, which is when scaffolding can be withdrawn.

In this study, the connection between the study on the effects of worksheets in Geometry on students' numeracy skills and Bruner's Scaffolding Theory centers on the idea of guided learning. Bruner's theory emphasizes the importance of breaking down complex tasks into manageable parts, allowing learners to build on prior knowledge. In the context of using worksheets, they serve as structured tools that progressively introduce students to geometric concepts. This gradual introduction supports students in mastering numeracy skills by allowing them to scaffold their understanding through step-by-step exercises that reinforce foundational concepts before moving to more complex problems.

The study was also anchored on Merrill's Instructional Design Theory. Merrill's principles highlight that learning is promoted when learners are engaged in solving real-world problems. Further, it says that existing knowledge is activated as a foundation for new knowledge and new knowledge is demonstrated, applied to the learner, and integrated into the learner's world. Merrill's Instructional Design theory relies on the different ways learning can be facilitated. Each phase in the learning process has an important role to play. There are four core phases of learning: demonstration, activation of previous knowledge, application, integration into real-world challenges. The approach is task-centered. Merrill believed answering multiple-choice, short-answer, or matching questions which rely only on a learners' memory is not sufficient for the application aspect of learning.

In this study, Merrill's Instructional Design Theory focuses on the principle that effective learning occurs when students are engaged with real-world problems and receive direct feedback. The use of worksheets in a Geometry setting can provide opportunities for students to apply their numeracy skills to practical problems, encouraging active engagement. Integrating real-life applications within the worksheet exercises, educators can enhance motivation and improve the relevance of learning, thereby promoting deeper understanding and retention of numeracy skills.

Lastly, Walberg's Theory on Performance as cited by Elger (2015), or e Theory of Performance (ToP) develops and relates six foundational concepts to form a framework that can be used to explain performance as well as performance improvements. To perform is to produce valued results. A performer can be an individual or a group of people engaging in a collaborative effort. Developing performance is a journey, and level of performance describes location in the journey. Current level of performance depends holistically on 6 components: context, level of knowledge, levels of skills, level of identity, personal factors, and fixed factors. Three axioms are proposed for effective performance improvements. These involve a performer's mindset, immersion in an enriching environment, and engagement in reflective practice.

In this study, Walberg's Theory on Performance highlights the significance of various factors, such as motivation, instruction, and learning environments—on students' academic performance. The study of worksheets in Geometry may demonstrate how well-structured worksheets can enhance these factors. For instance, when worksheets are designed to be interactive and provide immediate feedback, they can increase students' motivation and engagement, leading to improved academic performance in numeracy skills. This aligns with Walberg's view that optimizing these positive influences contributes significantly to learning outcomes.

3. Conceptual Framework

The conceptual framework of the present study was the input-process-output of developing worksheets in Geometry and its effects in the numeracy skills of the students. This framework provides a distinct trajectory for the investigation by explicating the connections among identified variables presented in Figure 2.

In the input phase, a pre-test was conducted to assess the students' initial understanding of geometrical concepts. The Pre-Test includes four key components: classify triangles and quadrilaterals based on their sides and angles; second, distinguishing between different types of quadrilaterals; calculate the perimeter of quadrilaterals that do not fall under the categories of squares or rectangles; and find the perimeter of composite figures that combine both triangles and quadrilaterals. This assessment provides a baseline measurement of the students' numeracy skills and understanding of geometry, which informs the subsequent design of the worksheets.

In the process phase, the design of Worksheets in Geometry was developed tailored specifically for grade 4 learners. The worksheets are structured around topics that align with students' learning needs, clear learning objectives, engaging activities designed to promote hands-on practice, and effective assessment to measure student progress. To ensure that the worksheets are valid, a curricular validity through three lenses: face validity, content validity, and construct validity. Finally, in the output phase, a post-test was administered to evaluate the effectiveness of the worksheets on the learners' numeracy skills. This Post-Test mirrors the structure and content of the Pre-Test, incorporating the same aspects related to geometry, such as classifying triangles and quadrilaterals, differentiating between various quadrilaterals, and calculating perimeters. The results of the Pre-Test and Post-Test was compared which determined the effectiveness of

the developed worksheets and quantify any improvements in the students' understanding and application of geometric concepts.

The feedback loop comprised collecting input from other mathematics teachers on the effectiveness of the developed worksheets in Geometry utilized to improve the numeracy skills of the Grade 4 learners. This feedback was then used to make any needed modifications to the recommendations and guarantee that they met the intended goals of the study.

4. Methodology

This section discussed the methodology and procedures involved in the conduct of this study. Specifically, it entailed the research design, research instrument as well as the statistical treatment of data.

Method Used

This study employed the descriptive-comparative and research and development to address the issues raised within its scope.

Statistical Tools

To analyze and interpret the data, the researcher employed Mean, Standard Deviation, Performance Level, Weighted Mean, T-test for dependent samples, Cohen's D to easily tally the data gathered through an online calculator/software.

Mean.
This was used to determine the status of learners' numeracy skills.

Standard Deviation.
This was used to determine the variability of the learners' numeracy skills.

Performance Level.
This was used to determine the level of learners' numeracy skills.

Weighted Mean.
This was used for the scale type of questions to measure how the respondents agreed on their evaluation.

T-Test for dependent sample.
This formula was used to compare the improvement of the numeracy skills of the Grade IV learners after the use of the developed worksheets.

Cohen's D.
This tool was used to measure the extent of effectiveness of the developed Differentiated Instruction material in Mathematics.

5. Results and Discussions

Numeracy skills are essential for Grade 4 students as they help in problem-solving, logical thinking, and daily tasks. Assessing their skills helps teachers understand their strengths and challenges, allowing them to improve teaching methods and provide better support. Factors like teaching strategies, resources, and student engagement affect their learning. Table 2 shows the student's competencies in numeracy skill of grade 4, its Differential Quadrilaterals, Classification of Triangles and Quadrilaterals, Perimeter of Quadrilaterals, and Perimeter of Composite Figures.

This reveals that the ability to differentiate among various quadrilaterals achieved the highest performance level, classified as developing, indicating that learners are making progress but still require further improvement. The mean score suggests a moderate overall proficiency in this area, reflecting a balanced distribution of understanding among students. Additionally, the standard deviation indicates a considerable variability in performance or heteregenous, implying that while some learners demonstrate a good grasp of the properties distinguishing quadrilaterals, others may struggle with identifying specific characteristics such as side lengths, angles, and parallel sides.

It can be inferred that that students are relatively better at distinguishing different types of quadrilaterals compared to other numeracy skills, but their overall performance level still needs to be improved, and significant variability exists among learners. This suggests that while some students have developed a solid understanding, many still need targeted instruction to strengthen their grasp of the distinguishing features of quadrilaterals. Consequently, educators should

focus on differentiated teaching strategies and more focused practice to ensure all students can confidently identify and differentiate these shapes, ultimately moving their understanding from developing to proficient.

The study by Sa'dijah et al. (2023) supports the findings of the previous research on students' performance in differentiating different quadrilaterals, as both studies indicate that students are generally at a developing performance level. They highlighted that students still require further guidance and practice to achieve a proficient understanding of quadrilaterals, which aligns with the conclusion that the current performance level is still developing. Therefore, their study corroborates the notion that students have not yet reached an advanced or proficient level in this area.

According to Walberg's Theory on Performance, as cited by Everist (2023), student performance is influenced by various factors such as motivation, learning environments, and instructional quality. This theory suggests that with appropriate support and resources; students can improve their academic performance from developing to higher levels. Therefore, the study's finding that students are currently in a developing performance level aligns with Walberg's perspective, indicating that targeted interventions could enhance their performance and help them attain higher achievement levels.

The performance in understanding the perimeter of composite figures indicates a predominantly beginning level of proficiency among students, reflecting significant challenges in applying their foundational knowledge to more complex, multi-shape problems. The low mean score suggests that many students are still developing their skills in this area. The relatively high standard deviation points to considerable variability in student performance, indicating a heterogenous group with some students making better progress than others. This variation underscores the need for differentiated instruction and targeted interventions to support learners at different levels of understanding, ensuring a more uniform development of spatial reasoning and problem-solving skills related to composite figures.

This implies that the low performance in understanding the perimeter of composite figures highlights a critical gap in students' foundational geometry skills, which can impede their overall mathematical development and readiness for more advanced topics. If unaddressed, this weakness may lead to persistent difficulties in spatial reasoning, problem-solving, and applying geometric concepts across diverse contexts. Therefore, targeted instructional strategies and differentiated support are essential to elevate student proficiency, promote equitable learning outcomes, and ensure that all students build a solid understanding of complex geometric problems essential for their academic success.

Furthermore, the study by Rakhmawati and Mustadi (2022) supports the findings of the current research regarding the students' performance levels. Their research indicates that a significant portion of students tend to perform at the beginning level, which aligns with the results showing that many students are still developing foundational skills. This consistency suggests that students predominantly remain at the initial stage of performance, highlighting the need for targeted interventions to promote progression to higher levels. Therefore, both studies collectively reinforce the observation that students' performance is concentrated at the beginning level, emphasizing the importance of focused educational strategies.

In the same vein, Walberg's Theory on Performance, as cited by Everist (2023), emphasizes the importance of environmental and psychological factors in enhancing student achievement. This theory supports the study's finding that students are currently at a beginning performance level, suggesting that their environment, motivation, and engagement may not yet be optimal for higher performance. Therefore, the theory aligns with the results by highlighting the need for improved learning conditions and support systems to elevate students' performance levels.

Overall, the status of the numeracy skills of Grade 4 learners along classifying triangles and quadrilaterals, differentiating different quadrilaterals, Perimeter of quadrilaterals, and Perimeter of composite figures had a mean of 11.08, a performance level of 27.69 described as developing and a standard deviation of 3.29.

This indicates that Grade 4 learners demonstrate a developing level of numeracy skills across key geometric concepts, including classifying triangles and quadrilaterals, differentiating quadrilaterals, and calculating perimeters of various figures. The mean score reflects a moderate performance, suggesting that while learners have made some progress, there is significant room for improvement. The relatively high standard deviation points to a heterogenous distribution of skills among students, with some learners performing substantially better or worse than the average. This variability underscores the need for targeted instructional interventions to address diverse learning needs and to elevate overall performance in these geometric topics.

Based on the results, it implies that the learners possess some foundational numeracy skills, particularly in identifying and classifying geometric shapes. However, there is a clear need to enhance their understanding and skills related to perimeter calculations, especially when dealing with non-standard shapes and composite figures. Targeted interventions should focus on providing more practice in these specific areas, using a variety of instructional strategies to address the gaps and improve overall numeracy proficiency. Furthermore, future assessments incorporate more practical, real-world problem-solving scenarios to better gauge learners' ability to apply these concepts.

This mathematics worksheet is designed to enhance students' understanding and mastery of numeracy skills related to geometric figures, focusing on classifying triangles and quadrilaterals, differentiating among various quadrilaterals, calculating the perimeter of quadrilaterals, and determining the perimeter of composite figures with multiple parts. The activities aim to develop students' ability to identify and categorize different types of triangles and quadrilaterals based on their properties. Through engaging exercises and practical problems, learners will strengthen their spatial reasoning and measurement skills. The assessment section provides opportunities for students to demonstrate their understanding and application of these concepts.

It can be analyzed that the design of the mathematics worksheet effectively integrates key aspects of numeracy skills related to geometric shape classification and measurement, with a cohesive focus on triangles and quadrilaterals. It begins by establishing clear objectives that guide students to identify, differentiate, and classify various triangles and quadrilaterals based on their properties, fostering both shape recognition and analytical thinking. The activities are thoughtfully structured to promote active engagement, including labeling, comparing properties, and calculating perimeters of individual figures, as well as applying these skills to more complex composite shapes through subdivision and summation. This hands-on approach not only reinforces conceptual understanding but also enhances computational accuracy.

This implies that the design of the mathematics worksheet on numeracy skills is likely structured to effectively enhance students' foundational mathematical abilities by incorporating a variety of engaging and progressively challenging activities. It emphasizes key concepts such as number recognition, basic operations, and problem-solving strategies, tailored to suit different learning levels. The thoughtful organization and clear instructions aim to foster confidence and independence in learners while providing opportunities for practice and mastery. Overall, the worksheet's design reflects an intent to cultivate a solid numerical foundation.

The study by Ekantini et al. (2017) supports the development of worksheets in mathematics, as they found that using worksheets significantly improved students' numeracy skills. Their results showed that learners who used targeted worksheets demonstrated better understanding and problem-solving abilities. Additionally, the study emphasized the importance of engaging activities within worksheets to enhance learning outcomes. Therefore, this research confirms that well-designed worksheets can effectively develop learners' numeracy skills.

Umriani et al. (2020) also support the use of worksheets, indicating that students who regularly practiced with worksheets showed notable improvements in their mathematical abilities. Their findings suggest that worksheets serve as effective tools for reinforcing concepts and providing practice opportunities. Moreover, the study highlighted that worksheets help in identifying students' misconceptions and addressing them promptly. Consequently, this study aligns with the idea that worksheets contribute positively to developing numeracy skills in learners.

Thirdly, Yulianti et al. (2020) present evidence that supports the development of worksheets, as their research demonstrated increased student engagement and understanding when worksheets were incorporated into lessons. They observed that learners became more confident and accurate in solving math problems after utilizing worksheets. Furthermore, the study noted that worksheets facilitate differentiated instruction, catering to various learning needs. Thus, their findings reinforce the notion that that worksheets are beneficial in improving learners' numeracy skills.

Finally, Gallardo-Saavedra et al. (2021) and Ramos et al. (2021) also support the development of worksheets, as both studies report improvements in learners' mathematical understanding and skills when worksheets are employed. Gallardo-Saavedra et al. noted that worksheets promote active learning and self-assessment, leading to better numeracy outcomes. Similarly, Ramos et al. found that worksheet-based activities foster independent problem-solving and confidence among students. In conclusion, these studies collectively affirm that worksheets play a significant role in improving learners' numeracy skills.

This study examines the curricular validity of a mathematics worksheet designed to enhance Grade 4 learners' numeracy skills. The evaluation focuses on face, content, and construct, ensuring the worksheet's effectiveness and alignment with educational standards. Results, summarized in Tables 3a–3c, include the weighted mean per criterion, overall weighted mean, verbal interpretation, and ranking. Table 3d presents the worksheet's overall curricular validity, highlighting its relevance and potential impact on learning.

The highest-ranked indicator in the table is the alignment of the worksheet with the age and learning level of the target user, with a weighted mean of 3.71, indicating it is very highly valid. Conversely, the indicator with the lowest rank is the relevance and quality of visual elements, which has a weighted mean of 3.14, placing it at the last position. The average weighted mean across all indicators is 3.45, reflecting an overall very highly valid perception of the curricular validity of the mathematics worksheets.

The results reveals that the mathematics worksheets are perceived to possess a strong face validity, primarily due to their appropriate alignment with the age and learning level of the target users. This high rating suggests that stakeholders intuitively believe the content appears suitable and relevant for the intended learners, reinforcing the instrument's relevance to the construct being measured. However, the relatively lower rating for the relevance and quality of visual elements indicates some room for improvement in making the worksheets more engaging and visually appealing, which could enhance their overall perceived validity. Despite this, the overall average score signifies a consensus that the worksheets are generally valid in appearance, effectively supporting their intended educational purpose based on superficial examination.

The strong face validity suggests that stakeholders trust the worksheets' alignment with learners' developmental levels, which can positively influence student engagement and learning outcomes. However, the identified need for improved visual elements indicates that enhancing aesthetic appeal could further bolster perceived relevance and overall effectiveness, ultimately leading to increased learner motivation and better educational results. Therefore, while the current worksheets serve their intended purpose well, investing in visual enhancements could optimize their impact, making them more compelling and effective tools for fostering student learning.

These findings align with Aunio (2019), who emphasized the significance of early numeracy skills in fostering mathematical competence and the necessity for valid and reliable assessment tools to identify students at risk. Furthermore, early intervention based on accurate assessments can significantly improve students' long-term mathematical outcomes. Ensuring the use of standardized tools allows educators to tailor instruction to meet individual student needs effectively. Ultimately, developing such assessment strategies is crucial for promoting equitable learning opportunities in mathematics education.

The findings of this study also align with previous research on mathematics learning strategies and student worksheets like Kasumati et al. (2018) who highlighted the effectiveness of a Mathematics Learning Strategy Module, which met validity, practicality, and effectiveness criteria, ultimately enhancing student engagement and understanding of mathematical concepts. Additionally, other studies have demonstrated that the use of well-designed worksheets can significantly improve students' problem-solving skills and confidence in mathematics. Furthermore, incorporating diverse learning strategies through worksheets has been shown to cater to different learning styles, thereby promoting inclusive and effective mathematics instruction. This consistency across research underscores the importance of carefully developed instructional materials in fostering better learning outcomes in mathematics education.

Similarly, Riyati and Suparman (2019) emphasized the importance of mathematical communication skills in 21st-century learning, demonstrating that problem-based learning worksheets significantly improve these skills. In this context, the current study's face validity assessment supports these findings, affirming that the developed worksheet enhances clarity, engagement, and usability, much like the Mathematics Learning Strategy Module.

Furthermore, studies on literacy and numeracy learning models further support these findings. Baharuddin et al. (2025) demonstrated that the problem-solving learning model positively affects students' literacy and numeracy skills, reinforcing the importance of structured and well-designed learning materials like worksheets. Likewise, students' self-efficacy significantly influences numeracy skills, suggesting that engaging and clear instructional materials play a crucial role in building mathematical confidence and problem-solving abilities.

Furthermore, Merrill's Instructional Design Theory, as cited by An (2021), supports the findings of the study on the curricular validity of worksheets in Mathematics in terms of face validity. This theory emphasizes the importance of designing instructional materials that are relevant, clear, and aligned with learners' needs and the curriculum. Consequently, the positive results regarding the face validity of the worksheets align with Merrill's principles, which advocate for materials that appear appropriate and credible to students and educators. Therefore, the theory's emphasis on meaningful and authentic content reinforces the study's conclusion that the worksheets effectively reflect the intended mathematical concepts, thereby affirming their face validity.

The highest-ranked indicator for curricular validity is the appropriateness of the language used in the worksheets, with a weighted mean of 3.85. Conversely, the indicator with the lowest rank is the clarity and effectiveness of the discussion, which has a weighted mean of 3.14. The average weighted mean across all indicators is 3.58, categorized as very highly valid, demonstrating that overall, the curriculum content of the mathematics worksheets is perceived as highly appropriate and valid, with particular strengths in language use and some areas for improvement in clarity of discussion.

This reveals that the curriculum validity of the mathematics worksheets is generally regarded as very high, reflecting a strong alignment with content standards and appropriateness. Notably, the use of suitable language in the worksheets significantly contributes to their validity, ensuring that learners can comprehend the material effectively. This emphasis on appropriate language supports the overall content validity by facilitating understanding and

engagement. However, there is a noticeable area for enhancement concerning the clarity and effectiveness of the discussion sections, which, despite being the lowest-ranked indicator, still maintains an acceptable level of validity. This suggests that while the core content and language are appropriate, improving the clarity and depth of explanations within the discussions could further strengthen the curriculum's overall validity.

This underscores the importance of maintaining and enhancing the quality of curriculum materials to ensure optimal student learning outcomes. The high validity score, driven largely by appropriate language use, indicates that the current worksheets effectively facilitate comprehension and engagement, which is crucial for mastering mathematical concepts. However, the relatively lower rating for the clarity and effectiveness of discussion sections highlights a vital area for improvement; clearer, more comprehensive explanations could deepen understanding and foster critical thinking.

The results are in consonance with the study of Umriani (2020) who designed a student worksheet with a problem-based learning model to improve creative thinking skills. The study found that existing worksheets did not support creativity, so there is a need for well-structured materials aligned with student characteristics. Furthermore, the implementation of the problem-based learning worksheet demonstrated a significant increase in students' creative thinking abilities. This suggests that carefully designed, student-centered materials can effectively foster creativity and enhance learning outcomes.

However, the study of Ekantini et al. (2017) warn against excessive teacher-led instruction, showing the importance of engaging worksheets that promote independent thinking. Incorporating such activities can foster students' critical thinking skills and enhance their overall learning experience. Therefore, balancing guided instruction with student-centered tasks is crucial for effective teaching and meaningful learning outcomes.

On the other hand, DepEd (2020) stressed the need for Alternative Learning Resources, aligning with the present study's focus on high-quality worksheets. These resources are essential in ensuring that students continue their learning effectively outside traditional classroom settings. Implementing such materials can help bridge gaps in understanding. Also, to promote student engagement across diverse learning environments.

Moreover, Merrill's Instructional Design Theory, as cited by An (2021), supports the findings of the study regarding the curricular validity of Mathematics worksheets in terms of content. This theory emphasizes the importance of designing instruction that aligns closely with learners' needs and real-world applications, ensuring that content is relevant and meaningful. Therefore, the study's results are consistent with Merrill's principles, suggesting that well-structured worksheets that adhere to these guidelines can effectively enhance the curriculum's validity by providing accurate and appropriate mathematical content.

The results indicates that the evaluation of the indicators demonstrates a strong content validity, with the illustrations' accuracy and relevance being notably prioritized by respondents, suggesting that visual aids effectively support lesson comprehension within appropriate contexts. However, the lower rating for activities linked to real-life situations highlights a potential gap in the practical application aspect of the content, indicating that while visual and contextual accuracy are well perceived, the integration of real-world relevance in activities may require further enhancement. Overall, the high average weighted mean underscores the validity of the constructs assessed, affirming that the indicators collectively capture essential aspects of content validity.

This implies that while the current instructional materials effectively utilize accurate and contextually relevant illustrations to enhance understanding, there remains a significant opportunity to improve the practical applicability of the activities by better linking them to real-life situations. This gap could limit students' ability to transfer learned concepts to real-world contexts, potentially affecting their overall engagement and the development of practical skills. Addressing this shortcoming through incorporating more real-life relevant activities would not only strengthen the practical aspect of the curriculum but also foster greater student motivation and real-world preparedness. Consequently, educators and curriculum developers may ensure a more holistic and applicable learning experience that aligns with the validated indicators of content validity.

These findings align with the study by Middleton et al. (2016) which supports the notion that worksheets can effectively contribute to the construct validity of mathematics assessments. Their research emphasizes that well-designed worksheets are capable of accurately measuring students' understanding of mathematical concepts, thereby aligning with the intended learning outcomes. This aligns with the idea that worksheets, when constructed thoughtfully, serve as valid tools for assessing specific mathematical constructs, reinforcing their role in evaluating students' comprehension and skills.

Conversely, Twycross (2015) presents a perspective that may challenge the assumption that worksheets inherently possess strong construct validity in mathematics education. The study highlights concern that worksheets often focus on rote memorization or procedural tasks, which might not fully capture the depth of students' conceptual understanding.

Consequently, this suggests that without careful design, worksheets could potentially undermine their validity in assessing the true mathematical construct, thus emphasizing the importance of quality and purpose in worksheet development to ensure construct validity is maintained.

Furthermore, Merrill's Instructional Design Theory, as cited by An (2021), supports the findings of the study on the curricular validity of worksheets in Mathematics in terms of construct. This theory emphasizes the importance of aligning instructional activities with learning objectives to promote meaningful learning experiences. Therefore, when worksheets are designed to reflect the core constructs of mathematical concepts, they effectively reinforce students' understanding, validating their relevance within the curriculum. Consequently, the application of Merrill's principles underscores the study's conclusion that well-constructed worksheets can enhance the integrity and coherence of the mathematical curriculum, thereby supporting their curricular validity in terms of construct.

The curricular validity summary table provides a comprehensive overview of the evaluation criteria used to assess the validity of a curriculum. Each criterion—Content, Construct and Face validity—is measured through an Average Weighted Mean to quantify its effectiveness. This is shown in Table 3d.

The overall average weighted mean for the curricular validity is 3.52, indicating a very highly valid assessment. Among the aspects evaluated, content received the highest score of 3.58, followed closely by construct validity at 3.52, and face validity at 3.45. These figures reflect strong agreement on the validity of the curriculum across all evaluated aspects.

Disclosed in the table, that the curricular validity indicates that the content domain received the highest weighted mean, earning the top rank. Conversely, the face validity, while still rated very highly, holds the lowest position among the three validity aspects. Overall, the curriculum demonstrates a very high level of validity, as reflected by the elevated average weighted mean.

The findings suggest that while the curriculum's content domain is highly valid and aligns well with educational standards, the relatively lower rating in face validity highlights a potential gap in how well the curriculum appears effective and relevant to stakeholders at first glance. This discrepancy underscores the importance of not only ensuring that the curriculum's content is comprehensive and accurate but also that it resonates with and is perceived as credible and appropriate by students, teachers, and other stakeholders. The overall very high validity score indicates a solid foundation for the curriculum's effectiveness; however, addressing the slightly lower face validity could enhance stakeholder confidence and engagement that may lead to a more successful implementation and better learning outcomes.

The study by Elias et al. (2023) supports the findings regarding the high validity of mathematics worksheets by demonstrating that well-designed instructional materials significantly enhance students' understanding and engagement. Their research emphasizes that when worksheets are carefully crafted to align with curriculum standards and learning objectives, they serve as effective tools for assessing and reinforcing mathematical concepts. Consequently, this study reinforces the notion that highly valid worksheets contribute positively to students' learning outcomes, validating the importance of curricular alignment in worksheet design.

On the other hand, Smith (2015) presents findings that somewhat contradict the emphasis on the high validity of worksheets in mathematics education. Smith's research suggests that, despite their validity, worksheets can sometimes lead to rote learning and lack of conceptual understanding if they are not appropriately integrated with active learning strategies. Therefore, while the study acknowledges the importance of validity, it highlights the potential limitations of worksheets in fostering deep understanding, indicating that their high validity alone may not be sufficient for effective mathematics instruction.

Merrill's Instructional Design Theory also reinforces the study's results, as it highlights the significance of well-structured instructional materials that facilitate meaningful learning experiences. The alignment of the worksheet's content with intended learning outcomes suggests that it follows effective instructional design principles, ensuring that students engage with and comprehend key concepts.

Numeracy skills play a crucial role in students' academic development, particularly in understanding geometric concepts. The integration of worksheets as an instructional tool aims to enhance learners' competencies in various mathematical skills. This study assesses the Numeracy Skills Level of Learners after the Application of Worksheets, focusing on four key competencies: Differentiating Quadrilaterals, Classification of Triangles and Quadrilaterals, Perimeter of Quadrilaterals (excluding squares and rectangles), and Perimeter of Composite Figures which is presented in Table 4.

The classification of triangles and quadrilaterals demonstrates notable progress among learners, transitioning from a developing stage towards approaching proficiency. The overall performance reflects a solid understanding, with the average score indicating that learners are nearing the competent level. Although there is some variability in individual scores, the moderate spread suggests that most learners are showing consistent improvement. This trend highlights a positive trajectory in mastering the concepts, signifying that learners are steadily advancing from foundational knowledge toward a more proficient grasp of classifying geometric figures.

This implies that as students move closer to proficiency, they build a stronger conceptual foundation that is essential for understanding more complex geometric principles and problem-solving tasks. This improved understanding not only enhances their confidence and engagement with geometry but also prepares them for higher-level math subjects that require precise classification and reasoning skills. Moreover, the consistent improvement across the group suggests that current instructional strategies are effective, indicating a promising direction for continued curriculum development.

Similarly, the findings of Miralda et al. (2022) emphasize the importance of structured learning approaches in developing students' ability to classify geometric shapes. Their study suggests that interactive teaching methods and visual representations significantly enhance learners' understanding of triangles and quadrilaterals. This aligns with the current approaching proficiency performance of students, indicating that consistent reinforcement and targeted instruction are contributing to their gradual improvement.

In line with this, Bruner's Scaffolding Theory, as cited by Piamsai (2020), highlights the importance of guided learning, where educators provide structured support to help students progressively build their understanding. This approach aligns with the current approaching proficiency performance of learners in Classifying Triangles and Quadrilaterals, as it suggests that the gradual improvement observed is a result of effective instructional support. Through offering step-by-step guidance and adjusting assistance based on student needs, educators help learners develop deeper comprehension of geometric classifications.

It can be analyzed that the average score suggests that, while there is noticeable progress, there remains room for improvement to reach full proficiency. The performance level indicates that most learners are nearing mastery, yet the standard deviation highlights a diverse range of understanding within the group. This heterogeneity underscores the need for targeted interventions to support those still developing and to solidify the knowledge of learners on the point of proficiency, ultimately guiding them toward full competency in the concept.

This implies that while overall progress suggests that many learners are close to mastery, the variability in understanding indicates that a one-size-fits-all approach may not be sufficient to ensure full proficiency for all students. Through implementing targeted interventions, such as personalized support or differentiated instruction, educators can help those still developing overcome specific challenges, thereby reducing disparities and promoting equity in learning outcomes. This focused effort not only accelerates individual student achievement but also enhances the overall effectiveness of the educational program, ensuring that more learners reach their full potential and are better prepared for subsequent learning milestones.

This is aligned with the study conducted by Gokbulut and Sen (2019) which highlights the significance of conceptual understanding in geometry. Their findings suggest that targeted instructional strategies, particularly visual and hands-on learning approaches, improve students' ability to distinguish quadrilateral properties with greater accuracy. This aligns with the current performance level of learners in Differentiating Different Quadrilaterals, which is now approaching proficiency. The gradual improvement observed in learners indicates that structured interventions, play a crucial role in enhancing students' comprehension and classification skills.

Furthermore, Bruner's Scaffolding Theory, as cited by Piamsai (2020), supports the findings of the study by highlighting how guided support enhances learners' understanding and skill development. The theory emphasizes that providing appropriate assistance helps learners progress from their current level to higher levels of competence, which aligns with the observed improvement in numeracy skills after using the developed worksheets. Therefore, the results indicating learners' approaching proficiency performance can be understood as a direct outcome of effective scaffolding, validating the theory's assertion that structured support facilitates learning and skill mastery.

This reveals that learners are currently in a developmental stage, demonstrating steady progress over time. With a moderate average score and a performance level classified as developing, it is evident that students are building foundational understanding in this area. The relatively uniform spread of scores suggests consistent learning among participants, although there remains room for growth to reach more advanced proficiency. Overall, the development trajectory is positive, indicating that with continued focus and instruction, learners are likely to enhance their grasp of the concepts related to quadrilaterals' perimeters.

This underscores the importance of sustained instructional effort to elevate learners from a developing stage toward greater mastery of quadrilaterals' perimeters. While the consistent performance indicates a solid foundational understanding across the cohort, the moderate scores highlight that students have not yet achieved proficiency, signaling a need for targeted interventions and enriched learning strategies. Addressing this gap is crucial, as advancing students' comprehension will enable them to apply their knowledge more confidently in problem-solving contexts, fostering deeper mathematical reasoning.

Furthermore, the study by Ransom and Manning (2015) supports the positive outcomes observed in the post-test of learners' numeracy skills after using the developed worksheets. Their research highlighted the effectiveness of targeted instructional materials in enhancing students' understanding and performance in mathematics. Similarly, the improved results in the post-test suggest that the worksheets effectively facilitated learning and skill development among the learners. Therefore, their findings align with the observed improvements, reinforcing the value of well-designed educational resources in promoting numeracy skills.

The data reveals that learners are currently in the developing stage when it comes to understanding the perimeter of composite figures, indicating that there is room for growth in this area. From the beginning of their learning journey to the present, progress has been made, but the overall performance still reflects ongoing development. The average score demonstrates a moderate level of proficiency, while the relatively low variability among learners suggests that most are experiencing similar challenges and successes.

This implies that although learners have shown progress, their current developmental stage indicates that foundational concepts may still be unclear or inconsistently applied, which could hinder their ability to solve more complex problems involving composite shapes. The relatively uniform performance among students suggests that instructional gaps are widespread rather than isolated, emphasizing the importance of revisiting core concepts, providing differentiated support, and integrating more hands-on or visual learning experiences. Addressing these challenges is essential to elevate learners from the developing stage to proficient mastery, thereby ensuring they build a stronger mathematical foundation that will support their future success in geometry and related areas.

Furthermore, the study by Bhoke (2024) supports the findings of the previous research on learners' numeracy skills, demonstrating that the use of specially developed worksheets significantly enhances students' understanding and performance. Both studies indicate that targeted instructional materials can effectively improve learners' numerical abilities, especially as they progress from beginning to approaching proficiency levels. These results collectively highlight the positive impact of well-designed teaching aids on elevating learners' numeracy skills, reinforcing the importance of such interventions in educational settings.

The overall numeracy skills after the application of the worksheets involved a total of 40 items, with a mean score of 20.85, corresponding to an overall performance level of approaching proficiency. The standard deviation across all competencies was 3.74, indicating a heterogeneous distribution of scores among learners. Individually, the competencies ranged from 9 to 12 items, with mean scores between 4.23 and 6.23, and performance levels mostly approaching proficiency, except for some developing levels.

The results indicate a significant improvement in learners' numeracy skills following the use of the worksheets, as evidenced by the overall performance approaching proficiency. The mean score suggests that, on average, learners are progressing steadily toward proficiency levels, demonstrating better understanding and application of numeracy concepts. Although there is some variability among learners, as reflected by the standard deviation, the distribution of scores within individual competencies shows that most students are advancing, with many nearing or achieving proficiency. This positive trend highlights the effectiveness of the worksheets in enhancing learners' numeracy abilities.

It can be inferred that the findings are significant for educational practice, as they suggest that targeted, worksheet-based interventions can effectively promote growth in learners' numeracy skills, moving them closer to proficiency. This progression underscores the importance of incorporating structured, skill-focused activities into the curriculum to foster steady improvement, especially given the observed variability among students. The results advocate for the continued use and refinement of such worksheets, potentially combined with differentiated instruction to address those still developing. This indicates that strategic, evidence-based instructional tools can play a crucial role in closing the achievement gap in numeracy.

Furthermore, the study by Rakhmawati and Mustadi (2022) supports the positive impact of using developed worksheets on learners' numeracy skills. Their research indicates that students who engaged with specially designed worksheets showed significant improvement in their understanding and application of mathematical concepts. Similarly, the post-test results in the current study demonstrate a notable increase in learners' numeracy abilities after utilizing the developed worksheets. Therefore, both studies collectively suggest that well-designed instructional materials can effectively enhance learners' numeracy skills.

Bruner's Scaffolding Theory, as cited by Piamsai (2020), supports the results of the study on the numeracy skills of learners approaching proficiency. This theory emphasizes the importance of providing learners with temporary support to help them achieve higher levels of understanding, which aligns with the observed improvement in learners' numeracy skills. The scaffolding process facilitates learners' transition from dependent to independent problem-solvers, thereby enhancing their proficiency. Consequently, the findings of the study are consistent with Bruner's concept that guided assistance and structured support can significantly promote learners' development in numeracy skills.

T-Test for dependent samples was used to determine whether a difference between the level of mathematics numeracy in grade 4 learners before and after the conduct of worksheet. Reflected in Table 5 was the result of the t-test on the difference between learners' level of mathematics numeracy before and after the conduct of worksheet. The overall mean, t-statistic value, t-critical value, and verbal interpretation are also reflected in Table 5. The significance level applied in the t-test was 5% for the two-tailed test.

The substantial difference between pre-test and post-test scores, as indicated by the p-value of 0.000, reveals a highly significant improvement in learners' numeracy skills following the worksheet application. The mean score increased from 11.08 to 20.85, suggesting the worksheet was effective in enhancing their understanding and proficiency in numeracy concepts. The t-statistic of 10.854 further supports the statistical significance of this observed improvement, indicating a large effect size.
This demonstrates a clear positive impact of the worksheet on learners' numeracy abilities. The pre-test mean serves as a baseline measure of initial skill levels, while the post-test mean reflects the gains achieved after the intervention. The p-value provides strong evidence to reject the null hypothesis that there is no difference, thus supporting the inference that the worksheet directly contributed to the observed increase in numeracy skills. The magnitude of the difference suggests a notable practical significance.

This implies that highlighting that targeted instructional materials can lead to meaningful learning gains. This finding also suggests that incorporating similar worksheets into curriculum design could substantially enhance students' understanding and confidence in numeracy, which are critical skills for academic success and everyday problem-solving. Moreover, the strong statistical evidence supporting the effectiveness of such interventions provides educators and policymakers with a compelling reason to invest in resource development and instructional strategies that actively engage learners and foster skill development.

The findings align with the study conducted by Choycawen et al. (2024), which investigated the effectiveness of supplementary materials in teaching mathematics. Their research found that learners using supplementary materials were able to answer more effectively by applying what they had learned from their reading. The materials helped students retain information, receive tutoring, track progress, and connect their knowledge to a broader context. Additionally, learners who followed structured instructions and processes within the materials demonstrated higher engagement and performance.

The study's findings support Bruner's Scaffolding Theory, which emphasizes structured guidance to help students develop skills until they achieve independence. The worksheet acted as a scaffold, enabling students to build foundational numeracy skills before progressing to more complex concepts, as evidenced by improved post-test scores. Additionally, the results align with Merrill's Instructional Design Theory, which stresses the importance of real-world problem-solving in effective learning. The worksheet's structured activities promoted comprehension and retention by incorporating key instructional elements.

The study aimed to evaluate the effect of worksheets on students' mathematical numeracy and understanding across various topics, including Differentiating Quadrilaterals, Classification of Triangles and Quadrilaterals, Perimeter of Quadrilaterals (excluding squares and rectangles), and Perimeter of Composite Figures. The effectiveness of the developed worksheets is reflected on Table 6.

Table 6 reveals a significant improvement in numeracy skills from pre-test to post-test, with the mean score rising from 11.08 to 20.85, indicating a substantial gain after implementing the worksheet. The standard deviations, 3.29 for the pre-test and 3.74 for the post-test, suggest some variability among learners, yet the Cohen's d-value of 2.77, or large effect.

The results demonstrate a notable enhancement in learners' numeracy skills following the use of the developed geometry worksheets. This improvement is evident through the considerable increase in test scores, reflecting a significant leap in students' understanding of key concepts such as quadrilaterals, triangles, and the perimeter of various figures. Despite some variability among learners, the overall performance level shows a marked upward trend, underscoring the effectiveness of the instructional material. The strong effect size further highlights that the worksheets

substantially contributed to elevating students' mathematical proficiency, telling greater confidence and competence in their numeracy abilities within geometry.

This finding implies that well-designed instructional materials can serve as powerful tools to bridge gaps in learners' comprehension, leading to more meaningful engagement with core concepts such as quadrilaterals, triangles, and perimeters. Consequently, educators and curriculum developers should prioritize incorporating such targeted, interactive resources into their teaching strategies, as they not only elevate performance but also foster deeper conceptual understanding. This reinforces the idea that strategic use of effective teaching aids can substantially influence learners' mathematical proficiency, equipping them with essential skills that are foundational for advanced mathematical learning and problem-solving in real-world contexts.

This aligns with the research of Inan and Serdar (2017), which found that math worksheets based on Multiple Intelligences Theory significantly improved students' academic achievement. Their study demonstrated that tailoring instructional materials to different intelligences helps engage students more effectively. Additionally, the findings suggest that such approaches can foster greater motivation and confidence in learners. Overall, incorporating Multiple Intelligences Theory into worksheet design appears to be a promising strategy for enhancing educational outcomes.

Furthermore, the impact of targeted interventions on numeracy skills is reinforced by Bhoke (2024), whose study found significant improvements in students' mathematical abilities through structured intervention programs. These findings highlight the importance of tailored support in enhancing learning outcomes. Additionally, implementing such programs can help bridge gaps for underperforming students. Overall, targeted interventions prove to be an effective strategy for improving numeracy skills.

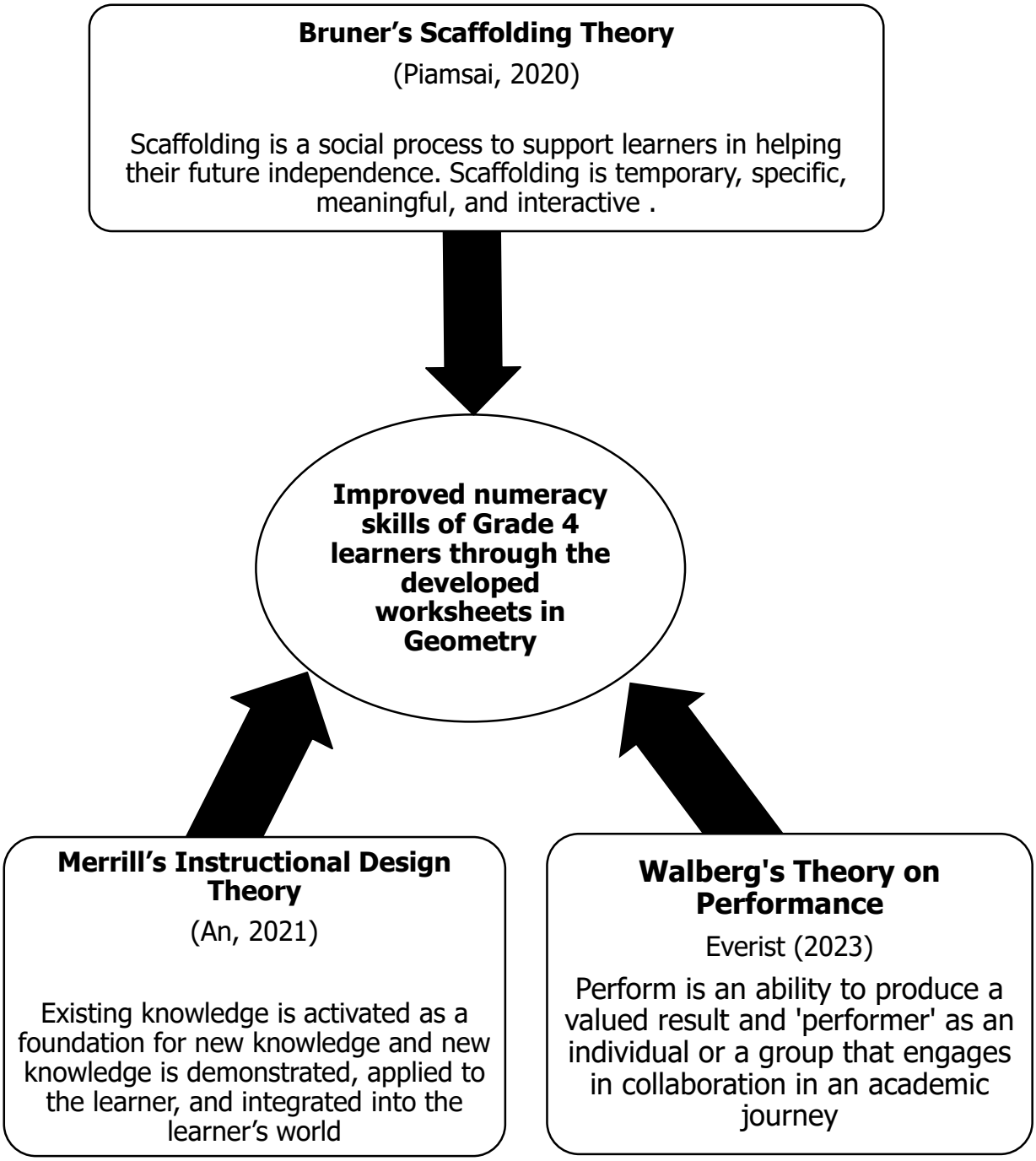
Beyond worksheets, the use of supplementary materials, as examined by Benito et al. (2022), was found to promote independent and interactive learning, reinforcing the benefits of structured educational resources. These materials encourage students to explore topics more deeply. They also cater to different learning styles, making lessons more engaging. Overall, supplementary resources enhance the effectiveness of traditional teaching methods.

The integration of Bruner's Scaffolding Theory, Merrill's Instructional Design Theory, and Walberg's Theory on Performance provides a strong theoretical foundation for understanding the effectiveness of worksheets in enhancing students' numeracy skills in Geometry. Bruner's Scaffolding Theory emphasizes the importance of guided learning, where complex tasks are broken down into manageable steps, allowing students to build on prior knowledge. Worksheets serve as structured tools that introduce geometric concepts progressively, enabling learners to scaffold their understanding through step-by-step exercises before advancing to more complex problems.

Similarly, Merrill's Instructional Design Theory highlights the significance of engaging students in real-world problem-solving while ensuring that new knowledge is activated, demonstrated, applied, and integrated into their learning experiences. In the context of this study, worksheets provide opportunities for students to apply their numeracy skills to practical problems, fostering active engagement and deeper understanding.

Lastly, Walberg's Theory on Performance underscores the role of motivation, instruction, and learning environments in academic success. Well-structured worksheets, when designed to be interactive and provide immediate feedback, can enhance these factors, thereby improving students' engagement and performance in numeracy skills. By aligning with these three theories, this study reinforces the idea that worksheets are effective instructional tools that support scaffolded learning, real-world application, and performance improvement in Geometry.

List of Figures



Geometry Worksheets and Numeracy Skills of Learners

The figure shows the interrelationship of theories that supported the aim of the study to improve the numeracy skills of the Grade 4 learners.

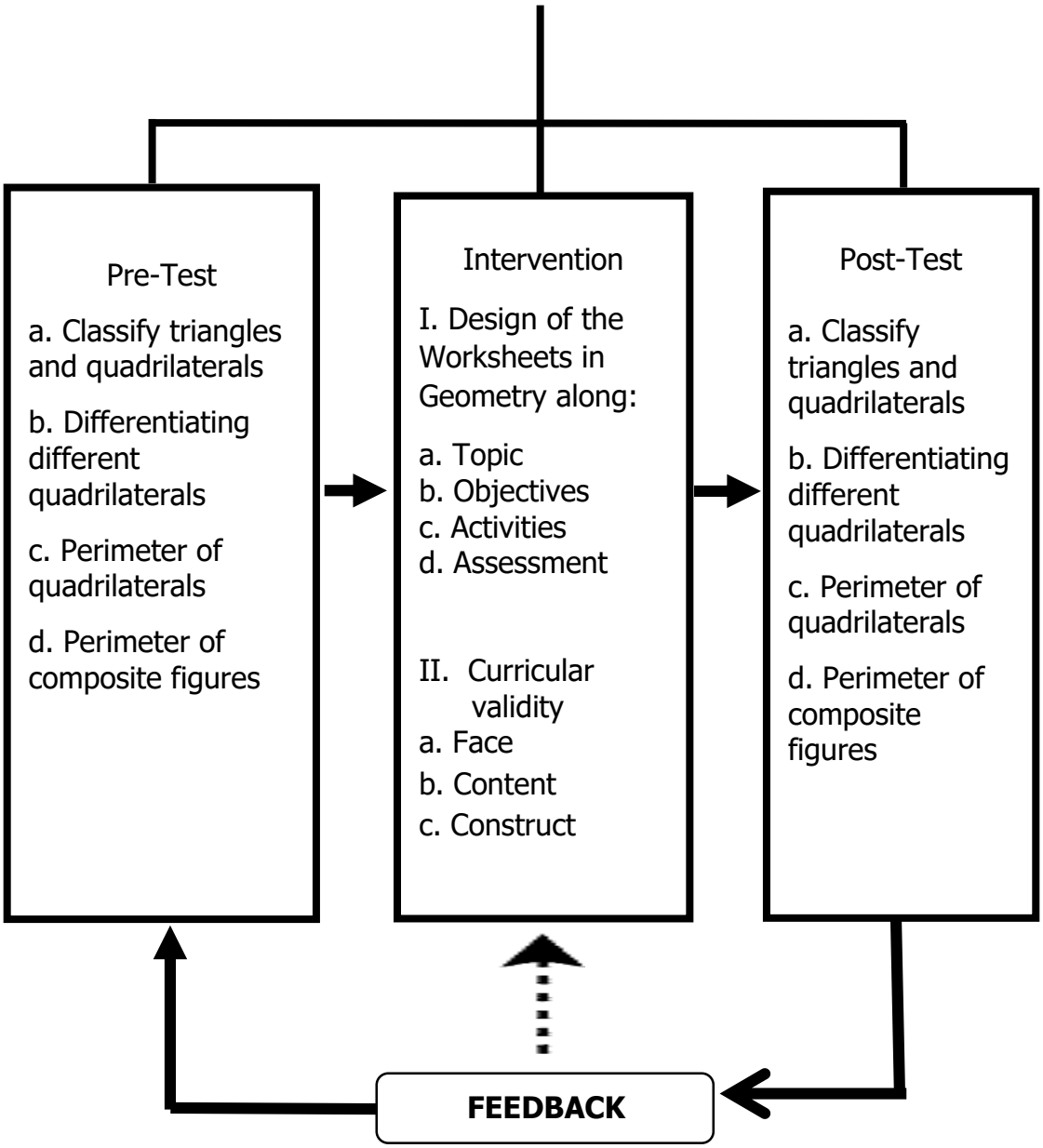


Figure 2

CONCEPTUAL PARADIGM

The process of crafting worksheets in Geometry for Grade 4 leaners.

standard deviation of 1.71.

Table 2

Numeracy Skills Status of Learners of Grade 4 based from pre-test

Competencies	NI	Mean	PL	Int	SD	R
Differentiating Different Quadrilaterals	9	3.04	33.76	D	1.71	1
Classification of Triangles and Quadrilaterals	12	3.77	31.41	D	1.58	2
Perimeter of Quadrilaterals (not squares/rectangles)	9	2.08	23.08	B	1.20	3
Perimeter of Composite Figures	10	2.19	21.92	B	1.23	4
Overall	**40**	**11.08**	**27.69**	**D**	**3.29**	

Performance Level's Value

Value	*Interpretation*
0.00-24.9	*(B) Beginning*
25.0- 49.9	*(D) Developing*
50.0-74.9	*(AP) Approaching Proficiency*
75.0-100	*(A) Proficiency*

Table 3a

Curricular Validity of the Mathematics Worksheets in Terms of Face

Indicators	Wm	Int	Rank
It aligns with the age and learning level of the target user.	3.714	VHV	1
All text is clear, readable, and correctly punctuated.	3.57	VHV	3
The organization of lessons and activities is learner-friendly.	3.57	VHV	3
Instructions are concise, unambiguous, and easily understood.	3.57	VHV	3
The structure provides a consistent sequence of lessons and activities.	3.50	VHV	5
The worksheet is complete, appealing, and visually engaging.	3.42	VHV	6.5
The worksheet incorporates a variety of activity types to maintain learner interest.	3.42	VHV	6.5
Numerical terms, symbols, and original terms are accurately represented.	3.28	VHV	8.5
Appropriate font size and style are used for emphasis.	3.28	VHV	8.5
Visual elements are relevant, support the learning objectives, and are of high quality.	3.14	HV	10
Average Weighted Mean	**3.45**	**Very Highly Valid**	

Legend:

Range Interpretations

3.26 to 4.00 Very Highly Valid (VHV)
2.51 to 3.25 Highly Valid (HV)
1.76 to 2.50 Moderately Valid (MV)
1.00 to 1.75 Fairly Valid (FV)

Table 3b

Curricular Validity of Mathematics Worksheets

in Terms of Content

Indicators	Wm	Int	Rank
Language used is appropriate for the learner's comprehension level.	3.85	VHV	1
Objectives are specific, measurable, reliable, attainable, and time-bound.	3.71	VHV	3
Assessment is related to the lesson and learners.	3.71	VHV	3
It conforms to the learning competencies.	3.71	VHV	3
Objectives measure higher-order thinking skills.	3.57	VHV	6.5
Illustrations are suitable for the topics and activities.	3.57	VHV	6.5
Activities are challenging, relevant, and appropriate for the topics covered.	3.57	VHV	6.5
Lessons are organized and in a logical sequence.	3.57	VHV	6.5
Examples are provided for developing learner's skills.	3.42	VHV	9
Discussion is clear and effectively conveys the intended concepts.	3.14	HV	10
Average Weighted Mean	**3.58**	**Very Highly Valid**	

Table 3c

Curricular Validity of the Mathematics Worksheets

in Terms of Construct

Indicators	Wm	Int	Rank
Illustrations provided are accurate and relevant to the lesson and contexts.	3.72	VHV	1
The material incorporates localized situations that resonate with learners.	3.71	VHV	2
Content is simplified, comprehensive, and reliable for effective learning.	3.71	VHV	2
Language is simple and easily understood by the learners to aid comprehension.	3.57	VHV	4.5
Information is presented creatively to engage learners.	3.57	VHV	4.5
Activities are arranged from easy to difficult to support gradual learning.	3.42	VHV	7.5
Topics are discussed sequentially to facilitate understanding.	3.42	VHV	7.5
The teaching style used motivates learners to participate and engage.	3.42	VHV	7.5
Learning activities have clear instructions and	3.42	VHV	7.5

appropriate illustrations.			
Activities are linked to real-life situations, enhancing relevance.	3.28	VHV	10
Average Weighted Mean	3.52	**Very Highly Valid**	

Table 3d

Summary of the Curricular Validity

Aspects	AWM	Int	Rank
Content	3.58	VHV	1
Construct	3.52	VHV	2
Face	3.45	VHV	3
Overall Average Weighted Mean	**3.52**	**Very Highly Valid**	

Table 4

Numeracy Skills after the Application of the Worksheets

Competencies	NI	Mean	PL	Int	SD	R
Differential Quadrilaterals	9	6.23	51.92	AP	1.68	1
Classification of Triangles and Quadrilaterals	12	5.81	64.53	AP	1.52	2
Perimeter of Quadrilaterals (not squares/rectangles)	9	4.23	47.01	D	1.34	3
Perimeter of Composite Figures	10	4.58	45.77	D	1.24	4
Overall	**40**	**20.85**	**52.12**	**AP**	**3.74**	

Table 5

Significant Difference between the level of Numeracy Skills of learners before and after the Application of Worksheets

Assessment	Mean	t-stat	P – value	Interpretation
Pre-test	11.08	10.854	0.000	Significant
Post-test	20.85			

Table 6

Degree of Effectiveness of the Worksheet in the Numeracy Skills of Learners

Assessment	Mean	Standard Deviation	Cohen's d-value	Interpretation
Pre-test	11.08	3.29	2.77	Large Effect
Post-test	20.85	3.74		

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