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ENHANCING MATHEMATICAL COMPETENCE OF GRADE 6 LEARNERS THROUGH INSTRUCTIONAL STRATEGIES AND LEARNER ENGAGEMENT

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ABSTRACT

This study determined the relationship between instructional strategies, learner engagement, and mathematical competence of Grade 6 learners in District I of Urdaneta City Division for the School Year 2025–2026. A descriptive-correlational research design was employed, utilizing researcher-made questionnaires and a teacher-made Mathematics achievement test as primary instruments. The respondents included selected Grade 6 learners and their Mathematics teachers. Findings revealed that instructional strategies in terms of teaching methods obtained a grand weighted mean interpreted as Agree, indicating that teachers generally use effective strategies such as clear explanations, questioning techniques, and real-life applications, although problem-based and guided learning strategies were less emphasized. Instructional materials obtained the highest mean, also interpreted as Agree, showing that teachers frequently use textbooks, worksheets, and visual aids, while digital tools and manipulatives were less utilized. Differentiated instruction obtained the lowest mean, interpreted as Agree, suggesting partial implementation of learner-centered approaches. In terms of learner engagement, participation, interest, and motivation were all interpreted as Agree, indicating that learners are generally active, interested, and motivated in learning Mathematics, although some indicators showed moderate levels such as confidence in answering tasks and enjoyment in problem-solving activities. Overall, the study concludes that both instructional strategies and learner engagement are at a satisfactory level but require further enhancement, particularly in differentiated instruction and learner-centered approaches. Strengthening inquiry-based learning, integrating technology, and improving learner engagement strategies may further enhance learners' mathematical competence.

Keywords: *Instructional Strategies, Learner Engagement, Mathematical Competence*

INTRODUCTION

Mathematics remains one of the most essential learning areas in basic education across the world, yet it continues to be a subject that many learners struggle to fully understand and appreciate. Internationally, concerns about learners' mathematical competence have been consistently highlighted in various studies, showing that many students experience difficulty in applying mathematical concepts to real-life situations. While learners may be able to perform basic computations, they often struggle with deeper conceptual understanding and problem-solving tasks. This gap is not necessarily due to a lack of ability, but rather limited opportunities to experience mathematics in meaningful, engaging, and learner-centered ways. As education systems continue to emphasize the development of critical thinking and higher-order skills, there is a growing need to examine how teaching practices and learner engagement contribute to improved learning outcomes (OECD, 2019).

Studies in mathematics education have consistently emphasized the critical role of instructional strategies in improving learners' academic performance. Research shows that classrooms that employ interactive, learner-centered approaches tend to produce better outcomes compared to those that rely heavily on traditional lecture methods. Learners develop deeper understanding when they are actively engaged in exploring concepts, discussing ideas, and solving problems collaboratively. Such approaches move beyond memorization and allow learners to construct meaning from their experiences. Moreover, inquiry-based learning and problem-solving activities have been found to significantly enhance learners' ability to retain and apply mathematical concepts in various contexts, making instruction more meaningful and effective (Bransford et al., 2000).

Instructional strategies play a crucial role in shaping how learners perceive and understand Mathematics. In many parts of the world, traditional teaching methods that focus on memorization and procedural knowledge are still widely used. While these approaches may help learners follow steps and arrive at correct answers, they often fail to develop lasting understanding. Learners tend to forget concepts when they are not actively involved in the learning process. On the other hand, the use of varied, interactive, and learner-centered strategies encourages learners to think critically, collaborate with others, and make meaningful connections. Approaches such as questioning techniques, real-life applications, and problem-based learning have been shown to enhance both engagement and understanding. However, these strategies are not always consistently implemented, making it important to assess their actual use in classroom settings (Hattie, 2009).

In the same way, learner engagement has been widely recognized as a key factor influencing achievement in Mathematics. Studies reveal that learners who demonstrate high levels of interest and motivation are more likely to persist in challenging tasks and

perform better academically. Engagement affects not only participation but also the depth of understanding, as learners become more invested in the learning process. When Mathematics is presented in a meaningful and relevant way, learners are more likely to develop positive attitudes toward the subject. Furthermore, supportive classroom environments and consistent teacher encouragement have been shown to strengthen learners' confidence and willingness to engage. These findings highlight the importance of fostering both effective instructional strategies and active learner engagement to improve mathematical competence (Fredricks et al., 2004).

Equally important is learner engagement, which has been recognized globally as a key factor influencing academic success. Engagement goes beyond mere participation; it includes the emotional and cognitive involvement of learners in the learning process. Learners who are interested, motivated, and actively involved are more likely to persist in solving challenging problems and develop confidence in their abilities. Conversely, low engagement often results in passive learning, where learners depend heavily on teacher instruction and show little initiative. This highlights the importance of creating learning environments that are supportive, interactive, and relevant to learners' experiences (Skinner & Belmont, 1993).

In addition, the diversity of learners presents a continuing challenge in mathematics education worldwide. Learners differ in their abilities, learning styles, and pace of understanding. Without appropriate instructional adjustments, some learners may struggle while others may not be sufficiently challenged. Differentiated instruction has been recognized as an effective approach in addressing these differences, as it allows teachers to modify content, process, and activities according to learners' needs. However, its implementation requires careful planning and teacher competence, which may not always be fully developed (Tomlinson, 2014).

At the national level, Mathematics education in the Philippines continues to face similar concerns. Despite the implementation of the K to 12 curriculum, many learners still encounter difficulties in mastering essential mathematical skills. In the context of Grade 6, mathematics serves as a critical foundation for higher-level thinking and problem-solving skills needed in secondary education. Learners at this stage are expected to demonstrate competence in operations, reasoning, and application of concepts. However, gaps in foundational skills, lack of engagement, and limited exposure to meaningful learning experiences remain evident in many classrooms (Department of Education, 2016).

In the Philippines, Mathematics instruction is guided by the goals and standards of the K to 12 Basic Education Program, which emphasizes the development of critical thinking, problem-solving, and learner-centered instruction among learners through the implementation of the curriculum standards prescribed by the Department of Education under DepEd Order No. 21, s. 2019. Furthermore, the Enhanced Basic Education Act of 2013 or Republic Act No. 10533 highlights the importance of providing quality education that equips learners with skills necessary for lifelong learning and national development. These policies emphasize the need for effective instructional strategies and meaningful

learner engagement to improve academic achievement, particularly in Mathematics education (Republic Act No. 10533, 2013).

In addition, the implementation of the K to 12 curriculum is anchored on the principles of learner-centered education, contextualization, and inclusive instruction as emphasized in policies of the Department of Education. DepEd Order No. 42, s. 2016, also known as the Policy Guidelines on Daily Lesson Preparation for the K to 12 Basic Education Program, emphasizes the importance of using appropriate teaching strategies, differentiated instruction, and varied learning resources to address diverse learner needs. Likewise, DepEd Order No. 8, s. 2015 on Classroom Assessment highlights the role of assessment in supporting learner progress and improving instruction. These policies reinforce the significance of effective instructional strategies and active learner engagement in achieving improved mathematical competence among learners (Department of Education, 2015).

In many Filipino classrooms, teaching practices are still largely teacher-centered, with a strong emphasis on completing lessons and preparing learners for assessments. While this ensures curriculum coverage, it may not always promote deep understanding. Learners may be able to follow procedures but struggle to explain concepts or apply them in different contexts. This situation highlights the need to strengthen instructional strategies that promote active learning, critical thinking, and collaboration. Teachers play a vital role in creating a classroom environment where learners feel confident to explore, ask questions, and express their ideas (Garcia & Weiss, 2017).

Learner engagement is also a growing concern in the Philippine context. Many learners show limited interest and motivation in Mathematics, often viewing it as a difficult and intimidating subject. Factors such as teaching style, classroom environment, and relevance of lessons influence learners' level of engagement. When lessons are not connected to real-life situations, learners may fail to see the value of what they are learning. Therefore, there is a need to examine how engagement can be enhanced through more meaningful and contextualized teaching approaches (Ormrod, 2020).

Furthermore, the role of assessment, parental involvement, and technology integration adds to the complexity of mathematics instruction in the country. While assessments are essential in measuring learning, they should also serve as tools for improving instruction. Similarly, support from parents and the effective use of technology can contribute to better learning outcomes. However, these factors are not always maximized, which may affect learners' overall performance in Mathematics (Epstein, 2018).

In the local context, particularly in the Division of Urdaneta City, classroom situations reflect many of these broader concerns. Based on classroom observations and informal discussions with teachers, it has been noted that while teachers demonstrate competence in delivering lessons, there are still challenges in sustaining learner engagement throughout Mathematics classes. Some learners actively participate during guided activities but become less involved during independent tasks, especially when lessons become more complex. There are also instances where learners hesitate to answer

questions or express their ideas, indicating a need to strengthen confidence and motivation (Creswell & Creswell, 2018).

Moreover, while instructional materials such as textbooks and worksheets are readily used, the integration of manipulatives, digital tools, and enrichment materials is not consistently practiced. Differentiated instruction is also observed but often limited due to time constraints and large class sizes. As a result, some learners who require additional support may struggle to keep up, while others may not be sufficiently challenged to maximize their potential (Tomlinson & Moon, 2013).

These classroom realities highlight the need to further examine the relationship between instructional strategies, learner engagement, and mathematical competence among Grade 6 learners in the Division of Urdaneta City. Understanding how these variables interact can provide valuable insights into improving teaching practices and learning experiences (Vygotsky, 1978).

Given these considerations, this study is grounded on the belief that enhancing instructional strategies and strengthening learner engagement can significantly improve mathematical competence. The findings of this study may serve as a basis for developing more responsive and effective instructional programs, ultimately helping learners become more competent, confident, and independent in Mathematics (Piaget, 1970).

Research Questions

This study aimed to determine the factors affecting the mathematical competence of Grade 6 learners of District I of Urdaneta City Division during the school year 2025-2026.

Specifically, it sought to answer the following questions:

1. What is the level of instructional strategies used in teaching Mathematics 6 in terms of:
    1.1 Teaching methods;
    1.2 Use of instructional materials; and
    1.3 Differentiated instruction?
2. What is the level of learner engagement in Mathematics 6 in terms of:
    2.1 Participation;
    2.2 Interest; and
    2.3 Motivation?
3. What is the level of mathematical competence of Grade 6 learners in terms of:
    3.1 Conceptual understanding;
    3.2 Problem-solving skills; and
    3.3 Computational skills?
4. Is there a significant relationship between instructional strategies and mathematical competence?
5. Is there a significant relationship between learner engagement and mathematical competence?

6. Based on the findings, what instructional enhancement program can be proposed to improve the learner engagement in Mathematics?

METHODOLOGY

Research Design

This study employed a descriptive-correlational research design. This design was appropriate because the study aims to describe the level of instructional strategies, learner engagement, and mathematical competence of Grade 6 learners, and at the same time determine the significant relationships among these variables. The descriptive aspect of the study focused on presenting the current status of the variables, while the correlational aspect examines whether relationships exist between instructional strategies and mathematical competence, as well as learner engagement and mathematical competence. This design did not involve manipulation of variables but rather observes and analyzes existing conditions in the classroom setting.

Sources of Data

The primary sources of data in this study were the selected Grade 6 learners and their Mathematics teachers from a public elementary school of District I of Urdaneta City Division during the School Year 2025–2026. The learners served as respondents for the learner engagement and mathematical competence variables, while teachers provided responses regarding instructional strategies used in teaching Mathematics 6. The study focused only on the selected respondents and did not include other grade levels or schools to maintain clarity and manageability of data collection.

Instrumentation and Data Collection

The main instruments to be used in this study were researcher-made questionnaire and a teacher-made Mathematics achievement test.

The questionnaire consisted of three parts. The first part gathered information on instructional strategies used by Mathematics teachers in terms of teaching methods, instructional materials, and differentiated instruction. The second part measured learner engagement in terms of participation, interest, and motivation. The questionnaire used a Likert scale to quantify responses.

The third instrument was a Mathematics achievement test designed to measure learners' mathematical competence in terms of conceptual understanding, problem-solving skills, and computational skills. The test was validated by experts in Mathematics education to ensure content validity and reliability.

Before data collection, permission was secured from the school head and concerned authorities. After approval, the researcher administered the instruments personally or with

the assistance of teachers. Data collection was conducted in a structured manner to ensure consistency and accuracy of responses. All gathered data were kept confidential and used solely for research purposes.

Tools for Data Analysis

The data collected in this study were analyzed using appropriate statistical tools.

To determine the level of instructional strategies, learner engagement, and mathematical competence, the mean was used. These helped describe the general tendencies of responses.

To determine the significant relationship between instructional strategies and mathematical competence, and between learner engagement and mathematical competence, the Pearson Product-Moment Correlation Coefficient (Pearson r) was used. This statistical tool is appropriate for measuring the strength and direction of relationships between variables.

All data were interpreted using a 0.05 level of significance to determine whether results are statistically significant or not.

RESULTS

Table 1.1
Level of Instructional Strategies in Terms of Teaching Methods

Indicators	Mean	Descriptive Equivalent
1. Uses clear and step-by-step explanations	3.85	Agree
2. Encourages active learner participation	3.70	Agree
3. Relates lessons to real-life situations	3.55	Agree
4. Uses questioning techniques	3.60	Agree
5. Provides guided practice	3.40	Moderately Agree
6. Encourages collaboration	3.50	Agree
7. Uses problem-based learning	3.35	Moderately Agree
8. Gives immediate feedback	3.45	Agree
9. Uses varied teaching strategies	3.62	Agree
10. Encourages oral explanation of answers	3.38	Moderately Agree
Average Weighted Mean	**3.54**	**Agree**

Table 1.2
Level of Instructional Strategies in Terms of Instructional Materials

Indicators	Mean	Descriptive Equivalent
1. Uses textbooks aligned with curriculum	3.90	Agree
2. Provides visual aids	3.75	Agree
3. Uses manipulatives	3.40	Moderately Agree
4. Provides worksheets	3.80	Agree
5. Uses digital tools or multimedia	3.35	Moderately Agree
6. Provides printed modules	3.85	Agree
7. Uses real-life objects	3.50	Agree
8. Provides enrichment materials	3.30	Moderately Agree
9. Uses assessment tools	3.70	Agree
10. Ensures materials are updated	3.78	Agree
Average Weighted Mean	**3.63**	**Agree**

Table 1.3
Level of Instructional Strategies in Terms of Differentiated Instruction

Indicators	Mean	Descriptive Equivalent
1. Adjusts teaching pace	3.45	Agree
2. Provides varied activities	3.50	Agree
3. Groups learners by ability	3.30	Moderately Agree
4. Gives support to struggling learners	3.70	Agree
5. Provides enrichment tasks	3.25	Moderately Agree
6. Uses varied assessments	3.40	Moderately Agree
7. Modifies instructions	3.35	Moderately Agree
8. Encourages peer tutoring	3.60	Agree
9. Uses flexible grouping	3.28	Moderately Agree
10. Considers learning styles	3.42	Agree
Average Weighted Mean	**3.43**	**Agree**

Table 2.1
Level of Learner Engagement in Mathematics 6 in Terms of Participation

Indicators	Mean	Descriptive Equivalent
1. Actively joins class discussions	3.60	Agree
2. Volunteers to answer questions	3.35	Moderately Agree
3. Participates in group activities	3.70	Agree
4. Shares ideas during class discussions	3.45	Agree
5. Completes classroom tasks actively	3.75	Agree
6. Listens and responds during lessons	3.80	Agree
7. Participates in math games or activities	3.40	Moderately Agree
8. Collaborates well with classmates	3.65	Agree

9. Participates in board work activities	3.50	Agree
10. Takes part in problem-solving tasks	3.55	Agree
Average Weighted Mean	**3.58**	**Agree**

Table 2.2
Level of Learner Engagement in Mathematics 6 in Terms of Interest

Indicators	Mean	Descriptive Equivalent
1. Shows curiosity in learning Mathematics	3.30	Moderately Agree
2. Pays attention during lessons	3.75	Agree
3. Enjoys solving math problems	3.25	Moderately Agree
4. Finds math lessons meaningful	3.40	Moderately Agree
5. Reads math instructions carefully	3.70	Agree
6. Enjoys group math activities	3.45	Agree
7. Shows excitement during math lessons	3.20	Moderately Agree
8. Engages with math-related tasks	3.55	Agree
9. Finds math interesting when taught with examples	3.60	Agree
10. Shows willingness to learn new math concepts	3.50	Agree
Average Weighted Mean	**3.47**	**Agree**

Table 2.3
Level of Learner Engagement in Mathematics 6 in Terms of Motivation

Indicators	Mean	Descriptive Equivalent
1. Strives to improve math performance	**3.60**	Agree
2. Completes math assignments on time	**3.80**	Agree
3. Persists in solving difficult problems	**3.35**	Moderately Agree
4. Studies math even outside class	**3.20**	Moderately Agree
5. Shows determination in learning math	**3.55**	Agree
6. Seeks help when struggling	**3.65**	Agree
7. Sets goals in improving math skills	**3.30**	Moderately Agree
8. Feels confident in mathematics tasks	**3.40**	Moderately Agree
9. Is motivated by teacher encouragement	**3.75**	Agree
10. Tries to improve after mistakes	**3.50**	Agree
Average Weighted Mean	**3.51**	**Agree**

Table 3
Relationship Between Instructional Strategies and Mathematical Competence

Variables	r-value (Pearson r)	Interpretation	Decision
Teaching Methods vs Mathematical Competence	0.62	Moderate Positive Relationship	Significant

Instructional Materials vs Mathematical Competence	0.68	Strong Positive Relationship	Significant
Differentiated Instruction vs Mathematical Competence	0.59	Moderate Positive Relationship	Significant
Overall Instructional Strategies vs Mathematical Competence	0.66	Strong Positive Relationship	Significant

Table 4
Relationship Between Learner Engagement and Mathematical Competence

Variables	r-value (Pearson r)	Interpretation	Decision
Participation vs Mathematical Competence	0.60	Moderate Positive Relationship	Significant
Interest vs Mathematical Competence	0.65	Strong Positive Relationship	Significant
Motivation vs Mathematical Competence	0.63	Strong Positive Relationship	Significant
Overall Learner Engagement vs Mathematical Competence	0.64	Strong Positive Relationship	Significant

DISCUSSION

Table 1.1 shows that teaching methods in Mathematics 6 obtained a grand weighted mean of 3.54, interpreted as Agree. This indicates that teachers generally apply effective instructional approaches such as clear explanations, questioning techniques, and real-life integration of lessons. However, indicators such as problem-based learning and guided practice received slightly lower ratings, suggesting that these strategies are not consistently maximized in all classroom situations.

This finding implies that while instruction is generally structured and effective, there is still room to strengthen learner-centered and inquiry-based approaches. According to Bruner (1966), meaningful learning occurs when learners are actively engaged in discovering concepts rather than passively receiving information. Similarly, Vygotsky's Social Constructivist Theory emphasizes that learning is enhanced through interaction and scaffolding, which aligns with the need for more collaborative and problem-based strategies.

Supporting this, Slavin (2018) emphasized that effective teaching methods significantly influence learner achievement, particularly when instruction is interactive and adapted to learners' cognitive levels. The present findings suggest that Mathematics 6 teachers are already practicing competent instructional delivery, but further enhancement in higher-order thinking strategies may lead to stronger learner outcomes.

The result in Table 1.2 shows that instructional materials obtained a grand weighted mean of 3.63, interpreted as Agree, which is the highest among the three instructional strategy indicators. This suggests that teachers frequently use textbooks, worksheets, visual aids, and modules that support the Mathematics 6 curriculum. However, lower means were observed in the use of manipulatives, enrichment materials, and digital tools.

This result implies that while basic instructional materials are well-established, innovative and technology-enhanced resources are still limited. According to Mayer's Cognitive Theory of Multimedia Learning (2009), learners understand mathematical concepts better when visual and interactive materials are used effectively. The limited use of digital tools may therefore restrict deeper conceptual understanding.

Similarly, Tomlinson (2014) stressed that varied instructional materials are essential in differentiated classrooms because they allow learners to access content in multiple ways. The findings of this study suggest that while instructional materials are competent in supporting basic instruction, expanding the use of manipulatives and digital learning tools may further enhance learner engagement and conceptual mastery.

Table 1.3 shows that differentiated instruction obtained the lowest grand weighted mean of 3.43, interpreted as *Agree*. This indicates that while it is being practiced in Mathematics 6 classrooms, it is not yet fully maximized. Teachers demonstrate strengths in supporting struggling learners and adjusting the pace of instruction to meet students' needs. However, aspects such as flexible grouping, the provision of enrichment activities, and adapting lessons to different learning styles received comparatively lower ratings, suggesting areas that still need improvement.

This suggests that while teachers attempt to address learner diversity, implementation is still inconsistent. According to Tomlinson (2014), differentiated instruction is most effective when teachers proactively adjust content, process, and product based on learner readiness and interests. The moderate result in this study indicates partial implementation rather than full integration.

Furthermore, research by Hall (2002) emphasized that differentiated instruction improves academic performance when consistently applied across classroom activities. The current findings imply that Mathematics 6 teachers demonstrate competence in differentiation but may benefit from further training and support to fully implement individualized learning strategies.

Overall, the instructional strategies in Mathematics 6 are interpreted as competent (grand mean = 3.53). This suggests that teachers are generally effective in delivering instruction, supported by adequate materials and structured teaching methods. However, differentiated instruction remains the weakest area, indicating the need for more learner-centered and adaptive teaching approaches.

This aligns with the findings of Hattie (2009), who emphasized that teacher effectiveness is one of the strongest influences on student achievement, particularly when instruction

is responsive to learner diversity. The results of this study reinforce the idea that improving instructional strategies—especially differentiation and interactive learning—can significantly enhance learners' mathematical competence.

The overall findings suggest that Grade 6 Mathematics instruction is already functioning at a satisfactory level, but not yet at an optimal level of innovation and differentiation. Strengthening inquiry-based learning, increasing the use of manipulatives and digital tools, and enhancing differentiated instruction strategies may further improve learners' engagement and performance.

Table 2.1 reveals that learner participation in Mathematics 6 obtained an average weighted mean of 3.58, interpreted as *Agree*. This suggests that learners are generally active and engaged in classroom activities, including discussions, group work, and problem-solving tasks. Moreover, they demonstrate a willingness to listen, respond, and collaborate with their classmates during Mathematics lessons, indicating a positive level of involvement in the learning process.

The highest-rated indicators, such as listening and responding during lessons and participating in group activities, suggest that learners are more responsive in structured and teacher-guided tasks. However, indicators such as volunteering to answer questions and participating in math games received slightly lower ratings, indicating that some learners are still hesitant to actively initiate participation.

This finding implies that while learners are behaviorally engaged, their confidence in expressing mathematical ideas may still need strengthening. Fredricks et. al.(2004) emphasized that behavioral engagement is the most visible form of engagement, but it does not always reflect deep cognitive involvement. Similarly, Skinner and Pitzer (2012) explained that participation improves when learners feel supported and safe in the classroom environment.

Overall, the results suggest that learners are actively participating, but there is still room to strengthen learner confidence and spontaneous involvement in mathematics activities.

Table 2.2 shows that the level of learner interest in Mathematics 6 obtained an average weighted mean of 3.47, interpreted as *Agree*. This indicates that learners demonstrate a moderate level of interest in learning Mathematics. They tend to be attentive during lessons and are able to find meaning in mathematical concepts, particularly when these are clearly explained and supported with relevant examples.

However, lower-rated indicators such as enjoyment in solving math problems and excitement during lessons suggest that learners do not consistently find Mathematics enjoyable or engaging. This means that while learners recognize the importance of Mathematics, their emotional connection to the subject is still developing.

According to Schiefele (1991), interest plays a crucial role in deep learning because it influences attention, persistence, and understanding. When learners have only moderate

interest, learning tends to remain surface-level rather than deeply conceptual. Likewise, Mayer's Cognitive Theory of Multimedia Learning (2009) suggests that engagement increases when instruction is visually rich, interactive, and meaningful.

These findings imply that teachers may need to strengthen instructional strategies by integrating more real-life applications, interactive tasks, and game-based learning to increase learners' interest in Mathematics.

Table 2.3 reveals that learner motivation in Mathematics 6 obtained an average weighted mean of 3.51, interpreted as *Agree*. This indicates that learners are generally motivated to complete their tasks and improve their performance in Mathematics. They demonstrate a willingness to accomplish assignments, respond positively to teacher encouragement, and seek assistance when necessary, reflecting a favorable level of motivation toward learning.

However, lower means were observed in indicators such as studying Mathematics outside class and persisting in difficult problems. This suggests that learners are more dependent on classroom instruction and external encouragement rather than exhibiting strong intrinsic motivation.

Deci and Ryan's Self-Determination Theory explains that motivation becomes stronger when learners experience autonomy, competence, and relatedness. When these needs are only partially met, learners tend to show moderate motivation rather than strong internal drive. Similarly, Hattie (2009) emphasized that teacher feedback and encouragement significantly influence learner motivation and achievement.

The findings imply that while learners are motivated to comply with academic requirements, their self-driven learning habits still need development. Strengthening independent learning activities and problem-solving challenges may help improve this aspect.

Overall, learner engagement in Mathematics 6 is competent but not fully developed, with all three dimensions—participation, interest, and motivation—falling under the Agree level. Participation is the strongest aspect, indicating good behavioral engagement, while interest is the weakest, suggesting the need for more engaging and meaningful instruction.

The results imply that learners are generally active in class but may not yet be fully emotionally and cognitively engaged in Mathematics. Strengthening interactive teaching strategies, contextualized learning activities, and learner-centered approaches may significantly enhance engagement and ultimately improve mathematical competence.

Table 3 reveals that there is a significant positive relationship between instructional strategies and mathematical competence among Grade 6 learners. The overall correlation coefficient of $r = 0.66$ indicates a strong positive relationship, meaning that as instructional strategies improve, mathematical competence also increases.

Among the indicators, instructional materials obtained the highest correlation (r = 0.68), suggesting that the availability and effective use of learning resources such as textbooks, modules, visual aids, and manipulatives play a crucial role in developing learners' mathematical skills. This aligns with Mayer's Cognitive Theory of Multimedia Learning, which emphasizes that students learn more effectively when information is presented through well-designed instructional materials that support dual-channel processing.

Teaching methods (r = 0.62) and differentiated instruction (r = 0.59) also showed moderate to strong relationships, indicating that interactive teaching approaches and learner-centered strategies contribute significantly to mathematical competence. This supports the constructivist theory of Bruner (1966), which posits that learners construct knowledge best when actively engaged in meaningful learning experiences.

Similarly, Vygotsky's Social Constructivist Theory highlights the importance of scaffolding and social interaction, which are evident in differentiated instruction practices. The findings are also consistent with Hattie's (2009) meta-analysis, which identified teacher effectiveness and instructional quality as among the most powerful influences on student achievement.

Overall, the findings imply that competent instructional strategies significantly enhance learners' mathematical competence, although further strengthening of differentiated instruction may further improve outcomes.

Table 4 shows that there is a significant positive relationship between learner engagement and mathematical competence. The overall correlation value of r = 0.64 indicates a strong positive relationship, suggesting that learners who are more engaged in Mathematics tend to demonstrate higher levels of mathematical competence.

Among the indicators, interest (r = 0.65) and motivation (r = 0.63) showed strong relationships with mathematical competence. This implies that emotional and psychological engagement play a crucial role in learners' ability to understand and apply mathematical concepts effectively. Schiefele (1991) emphasized that interest enhances attention, persistence, and deep learning, which are essential in Mathematics achievement.

Participation (r = 0.60) also shows a moderate positive relationship, indicating that active involvement in classroom activities contributes to improved mathematical performance. Fredricks, Blumenfeld, and Paris (2004) explained that behavioral engagement such as participation is a key predictor of academic success, although it must be supported by cognitive and emotional engagement to achieve deeper learning.

Deci and Ryan's Self-Determination Theory further supports the findings by explaining that motivation improves when learners experience autonomy, competence, and relatedness. When these needs are met, learners are more likely to engage actively and perform better academically.

Overall, the findings imply that higher learner engagement leads to better mathematical competence, highlighting the importance of strengthening interest-building activities, motivational strategies, and active participation in Mathematics 6 classrooms.

Conclusions

Based on the findings of the study, it was concluded that the instructional strategies used in Mathematics 6 are competently implemented; however, they are not fully maximized, especially in learner-centered and technology-enhanced approaches. Teachers demonstrate competence in delivering structured instruction, yet there remains a need to strengthen differentiated and interactive teaching strategies to better address the diverse needs of learners. Furthermore, learner engagement in Mathematics 6 was found to be moderately strong in terms of behavior and motivation, but relatively weaker in interest and intrinsic engagement. This suggests that while learners actively participate in classroom activities, they still lack a deeper emotional connection and sustained curiosity toward Mathematics. The findings also revealed that instructional strategies significantly influence learners' mathematical competence, as the effective use of instructional materials, appropriate teaching methods, and differentiated instruction contributes to better understanding and improved performance in Mathematics. Moreover, learner engagement plays a vital role in the development of mathematical competence, since students who are more interested, motivated, and actively involved in learning activities tend to achieve better academic performance in Mathematics.

Recommendations

Based on the findings of the study, several recommendations are proposed to improve teaching practices and learner performance in Mathematics 6. First, Mathematics 6 teachers are encouraged to further strengthen their instructional strategies by integrating more learner-centered and inquiry-based approaches in classroom instruction. Greater emphasis should be placed on problem-based learning, guided practice, and oral explanation of answers to develop learners' higher-order thinking skills. Teachers are also encouraged to maximize the use of instructional materials such as manipulatives, digital tools, visual aids, and enrichment resources to create more meaningful and interactive learning experiences. In addition, differentiated instruction should be implemented more consistently through flexible grouping, enrichment activities, and adaptation to learners' individual needs and learning styles. School administrators may also provide continuous professional development programs and instructional support to equip teachers with innovative and differentiated teaching strategies in Mathematics.

Moreover, to enhance learner engagement in Mathematics 6, teachers should design more interactive, meaningful, and enjoyable learning experiences that encourage active participation, interest, and motivation among learners. Opportunities for game-based learning, collaborative activities, and real-life problem-solving tasks should be increased to stimulate learners' curiosity and enjoyment in Mathematics. Teachers should likewise strengthen motivational strategies by providing consistent encouragement, recognition, and goal-setting activities that help learners develop intrinsic motivation. Activities that

promote independent learning and deeper engagement outside the classroom may also be encouraged to strengthen learners' confidence and sustained interest in the subject.

Furthermore, instructional strategies should be continuously improved because of their significant influence on learners' mathematical competence. Teachers should prioritize the effective use of instructional materials, particularly digital tools, manipulatives, and visual aids, to enhance learners' conceptual understanding. Instructional planning should also focus on interactive and differentiated teaching approaches that address diverse learner needs. Schools are likewise encouraged to support teachers through seminars, workshops, and training programs focused on innovative teaching strategies to ensure that instructional delivery remains aligned with the competencies required in Mathematics 6. Strengthening these instructional practices is expected to contribute to improved learner performance and deeper understanding of mathematical concepts.

Lastly, efforts to improve learner engagement should be strengthened since engagement significantly affects mathematical competence. Teachers are encouraged to implement strategies that promote active participation, sustained interest, and strong motivation among learners. This may include engaging instructional activities, contextualized lessons, and varied learning experiences that connect Mathematics concepts to real-life situations. Additionally, fostering a positive, supportive, and inclusive classroom environment is essential in helping learners participate confidently and develop a deeper appreciation for Mathematics. Schools may also implement recognition programs that acknowledge learner effort and achievement in Mathematics to further enhance motivation, confidence, and engagement.

Compliance with Ethical Standards

This study strictly adhered to ethical research standards to ensure the protection, rights, and dignity of all participants involved. In conducting the research, the following ethical principles were observed:

All participants—both department heads and teachers—were given a clear explanation of the study's objectives, scope, and procedures. Participation was voluntary, and no individual was forced or coerced to take part. Written informed consent was secured prior to data collection, ensuring participants fully understood their role in the study and the use of the data they provided.

Participant identities and school affiliations remained confidential. No identifying information appeared in the study's results or publication. Codes or pseudonyms were used to protect identities, and all data were stored securely and accessed only by the researcher.

Participants were informed of their right to withdraw from the study at any point without fear of penalty or consequence. This ensured that participation was completely voluntary and respectful of individual autonomy.

The study avoided any procedures that could cause physical, emotional, or psychological harm to participants. Survey and interview questions were carefully constructed to avoid sensitive or offensive content.

Data were reported accurately and objectively. No information was fabricated, misrepresented, or altered. The researcher committed to honest and transparent analysis and reporting of results, regardless of the outcomes.

Prior to data collection, written permission was obtained from the Department of Education – District I of Urdaneta City Division and the respective school principals. The study was also subject to the approval of a research ethics review committee, if required by the academic institution.

By upholding these ethical principles, the study aimed to promote academic integrity, protect participant welfare, and contribute responsibly to the field of educational leadership and instructional improvement.

REFERENCES

Bransford, J. D., Brown, A. L., & Cocking, R. R. (2000). How people learn: Brain, mind, experience, and school. National Academy Press.

Bruner, J. S. (1966). Toward a theory of instruction. Harvard University Press.

Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). SAGE Publications.

Deci, E. L., & Ryan, R. M. (2000). The what and why of goal pursuits: Human needs and the self-determination of behavior. Psychological Inquiry, 11(4), 227–268.

Department of Education. (2015). DepEd Order No. 8, s. 2015: Policy guidelines on classroom assessment for the K to 12 basic education program. Department of Education, Philippines.

Department of Education. (2016). K to 12 curriculum guide in Mathematics. Department of Education, Philippines.

Department of Education. (2016). DepEd Order No. 42, s. 2016: Policy guidelines on daily lesson preparation for the K to 12 basic education program. Department of Education, Philippines.

Department of Education. (2019). DepEd Order No. 21, s. 2019: Policy guidelines on the K to 12 basic education program. Department of Education, Philippines.

Epstein, J. L. (2018). School, family, and community partnerships: Preparing educators and improving schools (3rd ed.). Routledge.

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. Review of Educational Research, 74(1), 59–109.

Garcia, E., & Weiss, E. (2017). Education inequalities at the school starting gate. Economic Policy Institute.

Hall, T. (2002). Differentiated instruction: Effective classroom practices report. National Center on Accessing the General Curriculum.

Hattie, J. (2009). Visible learning: A synthesis of over 800 meta-analyses relating to achievement. Routledge.

Mayer, R. E. (2009). Multimedia learning (2nd ed.). Cambridge University Press.

OECD. (2019). PISA 2018 results (Volume I): What students know and can do. OECD Publishing.

Ormrod, J. E. (2020). Educational psychology: Developing learners (10th ed.). Pearson.

Piaget, J. (1970). Science of education and the psychology of the child. Orion Press.

Republic Act No. 10533. (2013). Enhanced Basic Education Act of 2013. Official Gazette of the Republic of the Philippines.

Schiefele, U. (1991). Interest, learning, and motivation. Educational Psychologist, 26(3–4), 299–323.

Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. Journal of Educational Psychology, 85(4), 571–581.

Skinner, E. A., & Pitzer, J. R. (2012). Developmental dynamics of student engagement, coping, and everyday resilience. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), Handbook of research on student engagement (pp. 21–44). Springer.

Slavin, R. E. (2018). Educational psychology: Theory and practice (12th ed.). Pearson.

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

Tomlinson, C. A., & Moon, T. R. (2013). Assessment and student success in a differentiated classroom. ASCD.

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

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