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Teachers' Strategies and Learners' Performance in Mathematics

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Abstract

This study examined the relationship between teachers' instructional strategies and learners' performance in mathematics in the Schools Division of Antique during the year 2025. Using a descriptive-correlational research design, the study sought to identify the instructional strategies commonly employed by teachers, determine the level of learners' performance in mathematics, and establish the relationship between these variables. The respondents comprised 203 public elementary teachers who were actively involved in mathematics instruction and were selected through total enumeration to ensure broad representation. Data were gathered through a validated questionnaire that measured teachers' use of cooperative learning, problem-solving activities, visual aids, and differentiated instruction. Learners' performance was evaluated in terms of problem-solving skills, conceptual understanding, and computational proficiency. Descriptive statistical measures, including frequency, percentage, mean, and standard deviation, were used to describe instructional practices and learners' performance, while the Pearson Product-Moment Correlation coefficient was applied to determine the relationship between the variables. The results showed that teachers frequently employed cooperative learning and problem-solving strategies, supported by the use of visual aids and differentiated instruction, which corresponded with high levels of learner performance in mathematics. A significant positive relationship was found between teachers' instructional strategies and learners' performance, indicating that effective and varied teaching approaches contribute to improved academic achievement. The study underscores the importance of dynamic, learner-centered instructional practices and recommends continuous professional development, adequate resource provision, and collaborative teaching efforts to further enhance instructional effectiveness and learner outcomes.

Keywords: Teachers' Strategies, Instructional Practices, Learners' Performance, Mathematics Education, Cooperative Learning, Problem-Solving, Differentiated Instruction

Introduction

Mathematics education is a vital component of academic development, as it cultivates learners' critical thinking, problem-solving abilities, and logical reasoning skills. Learners' performance in mathematics is shaped not only by their individual abilities but also by the instructional strategies applied by teachers (Hattie, 2009). Teachers' strategies, which include teaching methods, classroom activities, and assessment practices, play a crucial role in facilitating understanding, encouraging engagement, and improving achievement in mathematics (Marzano, 2017).

Previous research has shown that the use of varied and learner-centered strategies—such as cooperative learning, problem-based instruction, and the integration of visual and manipulative materials—can

significantly enhance learners' comprehension and academic performance in mathematics (Slavin, 2011). Furthermore, teachers who adjust instructional strategies to accommodate learners' diverse needs, learning styles, and classroom contexts are more likely to promote positive learning outcomes (Tomlinson, 2014). Effective instructional strategies are therefore essential in addressing challenges such as low engagement, mathematics anxiety, and gaps in foundational skills.

Within the Philippine context, particularly in the Schools Division of Antique, limited research has focused on the relationship between teachers' instructional strategies and learners' performance in mathematics. Gaining a clearer understanding of this relationship is important for informing teacher training initiatives, curriculum implementation, and school-based interventions aimed at improving academic outcomes. Hence, this study seeks to examine the instructional strategies employed by teachers and their influence on the mathematics performance of learners in the Schools Division of Antique during the year 2025.

Specifically, the study aims to answer the following questions: What instructional strategies do teachers employ in teaching mathematics, particularly in terms of cooperative learning, problem-solving approaches, and the use of visual or manipulative tools? What is the level of learners' performance in mathematics with respect to problem-solving skills, computational ability, and conceptual understanding? Is there a significant relationship between teachers' instructional strategies and learners' performance in mathematics? Moreover, the study seeks to identify which instructional strategies most effectively contribute to improved learner achievement. By addressing these questions, the study intends to provide practical insights for teachers, school administrators, and policymakers in enhancing instructional practices and optimizing learners' academic performance in mathematics.

Methodology

This study employed a descriptive-correlational research design to determine the relationship between teachers' instructional strategies and learners' performance in mathematics. The descriptive aspect focused on identifying the instructional strategies currently used by teachers and the corresponding levels of learners' performance, while the correlational aspect examined the strength and direction of the relationship between these variables.

The respondents consisted of 203 learners from different grade levels in the Schools Division of Antique, selected through total enumeration to ensure full representation of the population. Teachers responsible for mathematics instruction among these learners were also included through classroom observations to provide additional insights into the strategies being employed.

Data were collected using researcher-developed and validated instruments. Teachers' instructional strategies were measured through a questionnaire and an observation checklist that covered cooperative learning, problem-solving approaches, use of visual aids and manipulatives, and instructional differentiation. Learners' performance was assessed using standardized mathematics tests that measured computation skills, problem-solving ability, and conceptual understanding. The instruments were validated by experts in education and pilot-tested, resulting in a Cronbach's alpha coefficient of 0.88, which indicates high reliability.

Ethical considerations were strictly observed throughout the research process. Informed consent was obtained from all respondents, confidentiality of data was assured, and anonymity was maintained.

For data analysis, descriptive statistics such as frequency, percentage, mean, and standard deviation were used to describe the levels of instructional strategies and learners' performance. The Pearson Product-

Moment Correlation coefficient was employed to determine the relationship between teachers' instructional strategies and learners' performance at a 0.05 level of significance.

Results

The findings revealed that teachers employed a range of instructional strategies to enhance learners' performance in mathematics. Among these strategies, cooperative learning received the highest mean rating (M = 4.35, SD = 0.32), indicating that teachers frequently encouraged group activities and peer interaction. This was followed by problem-solving approaches (M = 4.28, SD = 0.36), suggesting that learners were often engaged in tasks requiring critical thinking and logical reasoning. The use of visual aids and manipulatives obtained a mean of 4.21 (SD = 0.38), reflecting moderate integration of diagrams, charts, and concrete materials in instruction. Instructional differentiation recorded the lowest mean among the strategies (M = 4.15, SD = 0.40), indicating that while teachers made efforts to adjust instruction to learners' needs, this strategy was used less frequently than others.

Learners' performance in mathematics was generally high, with an overall mean of 4.27 (SD = 0.35). Problem-solving skills ranked highest (M = 4.30, SD = 0.33), followed by conceptual understanding (M = 4.26, SD = 0.36) and computational skills (M = 4.25, SD = 0.37). These results indicate consistent learner performance across different mathematical competencies.

Correlation analysis using the Pearson Product-Moment Correlation coefficient revealed a significant positive relationship between teachers' instructional strategies and learners' performance in mathematics ($r = 0.61$, $p < 0.01$). This finding suggests that the more effectively teachers apply varied instructional strategies, the higher the learners' performance in mathematics. The results support earlier studies emphasizing the role of active instructional strategies, such as cooperative learning and problem-solving approaches, in improving student achievement (Slavin, 2018; Hattie, 2009).

Discussion

The results indicate that teachers' strategic use of cooperative learning and problem-solving approaches plays a significant role in improving learners' mathematics performance. Cooperative learning encourages active participation and peer interaction, which enhances understanding and retention of mathematical concepts, consistent with the findings of Slavin (2018). Similarly, problem-solving approaches promote critical thinking and analytical skills, which are essential for addressing complex mathematical tasks.

The use of visual aids and manipulatives provides learners with concrete representations of abstract concepts, facilitating deeper understanding, while instructional differentiation addresses individual learning differences and supports inclusive instruction. The significant relationship between teachers' instructional strategies and learners' performance supports Hattie's (2009) assertion that teacher effectiveness and instructional quality are among the strongest influences on student achievement.

These findings highlight the need for continuous professional development to strengthen teachers' capacity to implement varied and effective instructional strategies, particularly those that emphasize collaboration, problem-solving, differentiation, and the use of visual resources.

Conclusion

Based on the findings, it can be concluded that teachers in the Schools Division of Antique employ a variety of instructional strategies that significantly contribute to learners' performance in mathematics. Cooperative learning and problem-solving approaches emerged as the most frequently used strategies,

enabling learners to actively engage in collaborative and analytical learning activities. The use of visual aids and manipulatives further supports learners' understanding of abstract mathematical concepts, while differentiated instruction helps address diverse learning needs.

Learners demonstrated high levels of performance in problem-solving, conceptual understanding, and computational skills, indicating that the instructional strategies applied by teachers positively influence academic achievement in mathematics. The significant positive relationship between teachers' strategies and learners' performance emphasizes the critical role of effective teaching practices in promoting learner success.

Overall, the study reinforces the importance of employing dynamic, varied, and learner-centered instructional strategies to enhance learners' mathematical competencies and academic outcomes.

Recommendations

Based on the conclusions drawn from the study, the following recommendations are proposed:

Professional Development: School administrators should provide continuous training and professional development programs to strengthen teachers' skills in implementing cooperative learning, problem-solving activities, and differentiated instruction.

Instructional Resources: Schools should ensure the availability of sufficient instructional materials, including visual aids, manipulatives, and technology-based tools, to support diverse learning needs and enhance understanding of mathematical concepts.

Collaborative Practices: Teachers are encouraged to engage in collaborative planning and sharing of best practices to foster a professional learning community focused on instructional improvement.

Monitoring and Feedback: Regular monitoring and constructive feedback should be implemented to assess the effectiveness of instructional strategies and guide improvements in teaching practices.

Future Research: Further studies may explore the long-term effects of specific instructional strategies across different areas of mathematics and examine contextual factors that influence the effectiveness of these strategies.

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