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Enhancing Mastery of Number and Algebra Concepts Through Contextualized Math Drill Exercises Among Grade 7 Students

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Abstract

Mathematics plays a vital role in developing students' analytical thinking, logical reasoning, and problem-solving abilities. However, many Grade 7 students experience difficulty mastering foundational concepts in Number and Algebra due to the abstract nature of these topics. This study aimed to determine the effectiveness of contextualized math drill exercises in enhancing Grade 7 students' mastery of Number and Algebra concepts.

The study utilized a descriptive research design involving Grade 7 students from The Mabini Academy of Lipa, Batangas during the School Year 2025–2026. Data were gathered using a teacher-made pre-test and post-test to measure students' mastery levels, along with a researcher-made questionnaire to determine students' perceptions of contextualized drill exercises. Descriptive statistical tools such as mean, frequency, percentage, and ranking were used to analyze the data.

Results revealed that before the implementation of contextualized math drill exercises, most Grade 7 students demonstrated a moderate level of performance in Number and Algebra concepts, with 78.26% obtaining scores ranging from 9 to 15. Students positively perceived the use of technology-based drills (CM = 3.45), collaborative drills (CM = 3.40), and differentiated drills (CM = 3.40), indicating that these strategies were engaging and helpful in improving understanding and participation. After the intervention, the post-test results showed significant improvement, with 67.39% of the students achieving a High level of performance and 13.04% reaching the Very High level, while no learner fell under the Low category. However, challenges such as the need for more examples and explanations (WM = 3.45), unequal participation in group activities (WM = 3.13), and dependence on teacher guidance (WM = 3.02) were also identified. These findings suggest that contextualized math drill exercises effectively enhanced students' mastery of Number and Algebra concepts.

The study concludes that contextualized math drill exercises are an effective instructional strategy for enhancing students' mastery of Number and Algebra concepts. Integrating contextualized drills into mathematics instruction can help improve learners' engagement, confidence, and problem-solving skills.

Keywords: *Extrinsic Work Values, Intrinsic Work Values, Profile Variables, Beginning Teachers, Proficient Teachers*

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1. INTRODUCTION

Mathematics plays an important role in developing students' critical thinking, logical reasoning, and analytical skills. It enables students to interpret information, solve real-life problems, and make informed decisions. Among the fundamental areas of mathematics in junior high school are Number and Algebra concepts, which serve as the foundation for more advanced mathematical learning. However, many students struggle to understand and apply these concepts due to their abstract nature.

In many classrooms, students find difficulty transitioning from elementary arithmetic to more complex algebraic concepts. Topics such as rational numbers, sets, and roots of numbers require students to move from concrete computation to symbolic reasoning. As a result, students often rely on memorization of procedures rather than developing a deep conceptual understanding. These challenges frequently lead to low mastery levels and decreased confidence in mathematics.

Recent international and national assessments have highlighted concerns regarding students' mathematical proficiency. Many learners demonstrate limited ability to apply mathematical concepts in solving contextual and real-world problems. These findings emphasize the need for innovative instructional strategies that make mathematics more meaningful and accessible to students.

One approach that may address these challenges is the use of contextualized math drill exercises. Contextualization connects mathematical concepts to real-life situations that students can easily relate to, making abstract ideas more concrete and understandable. Drill exercises, when properly designed, can reinforce learning through repeated practice while promoting conceptual understanding and skill development.

This study investigates the effectiveness of contextualized math drill exercises in enhancing Grade 7 students' mastery of Number and Algebra concepts among Grade 7 students at The Mabini Academy of Lipa, Batangas. Specifically, the study sought to answer the following questions:

1. How may the performance of Grade 7 students in the teacher-made assessments on Number and Algebra be described?

2. In what ways did the incorporation of the following contextualized math drill exercises enhance students' mastery of Number and Algebra concepts?

    2.1. technology-based drills;

    2.2. collaborative drills; and

    2.3. differentiated drills?

3.How may the performance of Grade 7 learners be described after the implementation of the contextualized math drill exercises in Number and Algebra?

4. What challenges did Grade 7 learners encounter in mastering Number and Algebra concepts using contextualized math drill exercises?

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5. Based on the analysis of the study, how might the prepared contextualized math drill exercises be enhanced?

2. MATERIALS AND METHODS

Research Design

This study employed a descriptive research design to determine the effectiveness of contextualized math drill exercises in enhancing students' mastery of Number and Algebra concepts.

Participants

The participants were 46 Grade 7 students from The Mabini Academy of Lipa, Batangas during the School Year 2025–2026. The participants were selected using purposive sampling to represent students with varying levels of mathematical ability.

Research Instruments

The researcher was used two research instruments in this study to gather quantitative data. First, a teacher-made pre-test and post-test were administered to measure students' mastery of Number and Algebra concepts before and after the implementation of contextualized math drill exercises. Second, a researcher-made questionnaire was used to gather students' perceptions regarding the effectiveness, engagement, and usefulness of contextualized drill exercises in learning mathematics.

Procedure

Prior to data collection, permission was secured from the school administration. The researcher administered a pre-test to determine the students' initial mastery level in Number and Algebra concepts. After the pre-test, contextualized math drill exercises were implemented during mathematics lessons. Following the intervention, a post-test was administered to measure improvements in students' mastery levels. Students also completed the questionnaire to provide feedback regarding their learning experiences.

Data Analysis

The collected data were analyzed using descriptive statistical tools such as frequency and percentage, weighted mean, and ranking.

3. RESULTS

Section 1: Performance of Grade 7 students in Number and Algebra lessons using a teacher-made test

The results of the teacher-made pre-test revealed that the majority of Grade 7 students demonstrated a Moderate level of performance in Number and Algebra concepts. Specifically,

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78.26% of the learners obtained scores ranging from 9 to 15, indicating that students possess basic understanding of the lessons but still require further improvement to achieve mastery. Meanwhile, 13.04% of the students fell under the Low performance level, suggesting that some learners experienced difficulties in understanding and applying mathematical concepts. Only 8.70% of the students achieved a High level of performance, while no learner reached the Very High category. These findings imply that students still need reinforcement activities, remediation, and intervention strategies to strengthen their mathematical skills and improve their academic performance.

Section 2: Integration of Contextualized Math Drill Exercises Strengthens Students' Mastery of Number and Algebra Concepts

2.1 Technology-Based Drills

The findings revealed that students generally had a positive perception of technology-based drills, as indicated by the composite mean of 3.45 interpreted as Agree. Students found the digital drills engaging, motivating, and more enjoyable than traditional worksheets. They also agreed that the interactive format of the drills was easy to use and helped improve their practice and accuracy in solving mathematical problems. These results suggest that technology integration in mathematics instruction promotes active participation and enhances students' learning experiences. However, students still needed additional support in developing confidence in solving Number and Algebra problems independently, indicating the need for continuous guidance and reinforcement.

2.2 Collaborative Drills

The results showed that students generally viewed collaborative drills positively, as reflected by the composite mean of 3.40 interpreted as Agree. The statement "Working with classmates helped me understand the lessons better" obtained the highest weighted mean of 3.59, indicating that collaboration greatly contributed to students' comprehension of mathematical concepts. Students also agreed that collaborative drills made mathematics more enjoyable and increased their motivation to participate in learning activities. Furthermore, learners recognized that group drills helped improve communication skills and responsibility in learning. However, lower ratings in problem-solving strategies and mastery suggest that additional interventions are still needed to further strengthen higher-order thinking skills and conceptual understanding.

2.3 Differentiated Drills

The findings further revealed that students had a positive perception of differentiated drills, with a composite mean of 3.40 interpreted as Agree. The highest-rated statement, "I prefer having drills suited to my learning style and ability," indicates that students highly appreciate personalized and ability-based learning activities. Learners also agreed that varied exercises and activities focusing on difficult lessons helped address their individual learning needs. These findings demonstrate that differentiated drills support individualized instruction and provide students with learning experiences suited to their capabilities and preferences. However, the lower rating regarding mastery of Number and Algebra concepts suggests that further

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enhancement of the drills is still necessary to fully strengthen students' conceptual understanding and mathematical confidence.

Section 3: Performance of Grade 7 students after the contextualized math drill exercises in Number and Algebra concepts

The post-test results showed a significant improvement in the performance of Grade 7 students after the implementation of contextualized math drill exercises. Majority of the learners, comprising 67.39%, achieved a High level of performance with scores ranging from 16 to 23. Moreover, 19.57% of the students were classified under the Moderate level, while 13.04% attained a Very High level of performance. Notably, no student fell under the Low category during the post-test assessment. These findings suggest that contextualized math drill exercises effectively enhanced students' mathematical skills, improved their understanding of Number and Algebra concepts, and contributed positively to their academic performance in mathematics.

Section 4: Challenges encountered by the students in mastering number and algebra concepts using the contextualized math drills

Despite the positive outcomes, students also encountered several challenges during the implementation of contextualized drill exercises in learning mathematics. The findings revealed that students generally agreed that they encountered certain challenges while using the contextualized math drill exercises. The highest-rated challenge indicated that learners needed more examples, explanations, and clearer guidance before answering the activities. Students also experienced difficulties during collaborative tasks because not all members participated actively, and some learners still relied heavily on teacher guidance to complete the drills successfully. Despite these challenges, students generally found the activities manageable and the instructions understandable. Overall, the findings suggest that while contextualized math drill exercises are effective and engaging learning tools, additional instructional support, scaffolding, and teacher facilitation are still necessary to further strengthen students' mastery and confidence in Number and Algebra concepts.

4. DISCUSSION

The findings of the study indicate that contextualized math drill exercises significantly enhanced Grade 7 students' mastery of Number and Algebra concepts. The improvement in students' performance from the pre-test to the post-test suggests that the intervention effectively strengthened learners' understanding, accuracy, and problem-solving skills in mathematics. The use of technology-based, collaborative, and differentiated drills also increased students' motivation, participation, and engagement during learning activities. These instructional strategies allowed students to connect mathematical concepts to meaningful and real-life situations, making learning more interactive and learner-centered. This finding supports previous

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studies emphasizing that contextualized and varied learning activities contribute to better academic performance and conceptual understanding.

However, students also encountered several challenges during the implementation of the drills, such as the need for more examples, clearer explanations, and additional teacher guidance. Some learners also experienced difficulties in collaborative activities due to unequal participation among group members. These findings highlight the importance of proper scaffolding, structured implementation, and continuous teacher supervision to ensure effective learning. Overall, contextualized math drill exercises proved to be beneficial instructional tools that promote students' mastery, confidence, and active participation in mathematics learning.

5. CONCLUSION

This study concludes that contextualized math drill exercises are effective instructional strategies in enhancing Grade 7 students' mastery of Number and Algebra concepts. The intervention improved students' performance, understanding, engagement, and participation in mathematics activities. The integration of technology-based, collaborative, and differentiated drills helped learners develop better problem-solving skills and conceptual understanding while making mathematics learning more meaningful and enjoyable. Although some challenges were encountered, these can be addressed through proper teacher guidance, clear instructions, and sufficient examples. Therefore, contextualized math drill exercises provide practical and effective learning strategies for improving students' mathematical skills and academic performance.

RECOMMENDATIONS

Based on the findings of the study, it is recommended that mathematics teachers continuously integrate contextualized math drill exercises into classroom instruction to strengthen students' mastery of Number and Algebra concepts. Teachers may also provide additional examples, guided practice, and clear explanations before conducting drill activities to help learners better understand the lessons. Schools may encourage the use of technology-based and collaborative learning activities to increase students' engagement and participation in mathematics. Continuous teacher monitoring and facilitation are also necessary to ensure active participation and effective learning during group activities. Finally, future researchers may conduct similar studies involving other mathematical competencies and instructional strategies to further validate the effectiveness of contextualized math drill exercises in mathematics education.

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