**THE EFFECT OF THE MATHAGUYOD REMEDIATION PROGRAM ON THE ACADEMIC PERFORMANCE OF JUNIOR HIGH SCHOOL STUDENTS IN MATHEMATICS**

Abstract

This study investigates the impact of the Mathaguyod Program, a structured remediation initiative, on the mathematical performance of Junior High School students in Grades 7–10 at Federico Yap National High School. The study employed a quasi-experimental pretest-posttest design, involving 50 at-risk students selected based on their poor academic achievement. Grounded in Constructivist Learning Theory, participants received six hours of targeted instruction using learning modules specifically developed for the Mathaguyod Program over two weeks. A 40-item pre- and post-test was used to collect data. Statistical analysis via paired samples t-test revealed a significant increase in post-test scores (M = 22.70, SD = 7.45) compared to pre-test scores (M = 13.72, SD = 4.21), with a t-value of 10.86 and a p-value = .000. The findings suggest that the Mathaguyod Program can significantly improve the mathematical proficiency of struggling students. These results support the broader implementation of evidence-based remediation strategies in junior high school mathematics, highlighting the effectiveness of constructivist approaches in addressing academic challenges.

***Keywords:*** *remediation program, academic performance, junior high school, quasi-experimental design, mathematics*

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**Introduction**

There are issues with mathematics education worldwide, with many students finding it difficult to master the subject. To address such problems, remedial programs have been implemented all over the world (Duflo, Kiessel, Lucas, & Sabarwal, 2019). These programs aim to support struggling learners by providing targeted instruction that helps bridge foundational gaps and improve academic outcomes. Du and Lipscomb (2023) examined the impact of a remedial mathematics program on first-year math majors at the University of Southern Mississippi. According to the study, students who participated in the Jack Leaps Summer (JLS) Mathematics remediation program had significantly higher post-test scores than their peers who did not participate, which used a regression discontinuity methodology. This suggests that underprepared students' arithmetic performance can be significantly raised by well-designed remedial programs. Focused remediation greatly enhanced middle school students' mathematical skills, according to a study conducted in Switzerland by Moser Opitz et al. (2017). Similar gains in junior secondary school students' performance in mathematics were observed by Ajogbeje and Alonge (2012) because of feedback and interventions.

In the Philippines, many students continue to face challenges in mathematics comprehension, as evidenced by numerous studies on academic performance in the subject. Dela Cruz (2024) started the "Math-Saya ang Bakasyon" program at Galvan High School in Nueva Ecija to help incoming Grade 10 students who struggled with math. Through online tutorials delivered via Google Meet, the program significantly raised students' competency levels from "Developing" to "Approaching Proficiency." This community-focused project serves as an example of how structured remedial programs can improve junior high school students' mathematical proficiency.

To help students in the Davao Region perform better academically, especially in mathematics, the Department of Education has launched several remediation programs. In a quasi-experimental study conducted in Digos City, Davao del Sur, Dumigsi and Cabrella (2019) used strategic intervention materials (SIM) to address the problems Grade 9 students were having with quadratic functions. Their results, which showed a significant rise in the students' post-test scores, demonstrated the efficacy of SIM in mathematics remediation. This regional initiative is a component of a larger educational movement that seeks to enhance learning outcomes and offer targeted assistance in the area. These projects' local execution and assessment could produce important proof of their efficacy and guide upcoming regional educational initiatives.

Given the global and local success of remedial initiatives in mathematics education, there is a clear need to further examine how such programs can be adapted and applied within specific educational contexts. In line with these efforts, this study seeks to determine the effectiveness of a structured Mathaguyod program in improving the mathematical performance of Junior High School students in Grades 7–10 at Federico Yap National High School. These students were identified as at risk of failing due to their frequent absenteeism, low final examination scores, and consistently poor performance in both written and practical assessments. Being unable to effectively engage with higher-level mathematical topics due to this lack of foundational abilities emphasizes the significance of establishing targeted and organized rehabilitation programs. The Mathaguyod program leverages the Constructivist Learning Theory by providing scaffolded instruction that aligns with students' developmental levels, thereby guiding them from their current level of understanding to higher proficiency in mathematics. If found effective, the results of this study can contribute valuable evidence supporting the use of structured, theory-based remediation programs as a viable strategy for enhancing academic achievement in mathematics, especially among at-risk learners in the Philippine public school system.

**Statement of the Problem**

This study aimed to assess the effect of a Mathaguyod program on the academic performance of junior high school students.

**Hypothesis**

Ho₁: There is no significant difference in the academic performance of junior high school students before and after participation in the Mathaguyod program.

**Theoretical/Conceptual Framework**

This study is anchored in the Constructivist Learning Theory, which posits that learners actively construct knowledge based on prior experiences and through meaningful interaction with their environment. In this framework, learning occurs when students engage with content in ways that are personally relevant and cognitively challenging, often requiring guidance from teachers or more knowledgeable peers. The theory emphasizes the importance of scaffolding, temporary support structures that help students progress toward independent mastery of concepts. Constructivist principles have been effectively applied in mathematics education, where students who participate in inquiry-based, collaborative learning environments demonstrate significantly improved conceptual understanding and problem-solving skills (Boaler, 2022). Recent research by Angraini, Kania, and Gürbüz (2024) further supports this perspective, showing that constructivist-based instruction enhances students' computational thinking by enabling them to meaningfully engage with mathematical problems, draw on prior knowledge, and apply logical reasoning in diverse contexts. In this study, the structured *Mathaguyod* program embodies these principles by fostering an active, student-centered learning process grounded in exploration, reflection, and meaningful engagement with mathematical content.

Post-remediation students’ scores

Remediation Program

Pre-remediation students’ scores

*Figure 1. Conceptual Framework of the Effect of a Mathaguyod Program on the Academic Performance in Mathematics of Junior High School Students*

**Methodology**

This study explores the impact of a Mathaguyod program on the mathematical performance of junior high school students through a quasi-experimental methodology. Quasi-experimental methods are commonly used in educational research to evaluate the effects of interventions when random assignment is not feasible, enabling comparisons between naturally occurring groups, such as intact class sections (Fraenkel, Wallen, & Hyun, 2023). The Mathaguyod program aimed to address learning weaknesses and enhance student performance through tailored instructional strategies and resources, consistent with previous research emphasizing the efficacy of structured interventions in mitigating academic shortcomings (Allanigue, 1989; Dimatacot & Parangat, 2023). Pretests and posttests were conducted on the selected experimental groups to assess performance variations and evaluate the program's efficacy in improving mathematical competency among participants.

Fifty Grade 7–10 students, identified through purposeful sampling based on low academic performance in mathematics, participated in the study. Due to their elevated absenteeism, insufficient final scores on tests, and consistently poor performance on written and practical assessments, these students have been classified as at risk of failing. Parental consent was obtained before they participated in the study. The two-week remedial program consisted of six hours of targeted instruction using learning modules developed to address key mathematical gaps. The sessions were conducted by an educator in mathematics utilizing structured learning modules designed specifically to target the students' academic deficiencies and learning difficulties.

Participants in this study were junior high school students in Grades 7 through 10 who had been recognized as requiring remediation in mathematics at Federico Yap National High School. To evaluate students' understanding of the mathematical competencies the intervention was designed at, a 40-item multiple-choice assessment developed by the teacher was given both before and after the remedial sessions. The program's module included lessons and exercises that addressed the curricular competencies in mathematics for different grade levels, ensuring that the teaching resources and the evaluation items were in line. The final analysis primarily comprised students who completed the whole Mathaguyod program and finished both the pre-test and post-test assessments.

The Data were collected using pre- and post-test results. A paired sample t-test was utilized to assess whether a statistically significant difference occurred in the students' performance before and during the intervention, to evaluate the efficacy of the Mathaguyod program.

Throughout the research procedure, ethical considerations were carefully observed. Both parents, guardians, and students granted their informed consent. All activities were executed in compliance with the institutional requirements and the ethical standards set out by the Department of Education (DepEd), ensuring the confidentiality of student academic data.

**Results and Discussion**

This study examined the effectiveness of Federico Yap National High School's Mathaguyod Remediation Program in improving junior high school students' mathematical proficiency. 50 students in all, ranging in grade from 7 to 10, were specifically chosen to take part in the intervention under established academic standards. Since they frequently missed class, performed poorly on written and practical assessments, and obtained low final exam scores, these students had been at risk of failing. It was essential to put in place a systematic rehabilitation program since their ongoing struggles to grasp basic mathematical ideas, like basic operations and problem-solving techniques, severely limited their ability to interact with more complicated mathematical topics.

By using scaffolded training based on the ideas of constructivist learning theory, the Mathaguyod Remediation Program was established to fill these learning gaps. Six hours of specific instruction stretched over two weeks formed the intervention, which used customized modules that complemented the arithmetic curriculum. A 40-item multiple-choice pretest was given to the students prior to the remediation sessions to evaluate their baseline comprehension of important mathematical concepts. To ascertain the degree of learning gains related to the intervention, the same assessment was given as a post-test once the program was completed.

**Description of Results**

The data analysis employed a paired samples t-test to evaluate the difference between the pre-test and post-test scores of the participants. As presented in Table 1, the mean pre-test score of the students was 13.72 (SD = 4.21), which significantly increased to a mean post-test score of 22.70 (SD = 7.45) after the implementation of the Mathaguyod Remediation Program. This improvement reflects a mean gain of 8.98 points. The computed t-value of 10.86 and a p-value of .000 (p < .05) indicate that the difference between the two sets of scores is statistically significant, leading to the rejection of the null hypothesis. This suggests that the Mathaguyod program had a significant positive effect on students' academic performance in mathematics, with the post-test demonstrating its effectiveness in enhancing students' learning outcomes.

**Table 1. Test of Difference Between Pretest and Post-Test Scores**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Tests** | **Mean** | **SD** | **t-value** | **p-value** | **Decision on Ho** |
| Pre-Test | 13.72 | 4.21 | 10.86 | .000 | Rejected |
| Post-Test | 22.70 | 7.45 |

**Discussion**

The effectiveness of established and scaffolded interventions in improving mathematics performance among at-risk learners can be seen by the significant rise in the students' post-test scores after the Mathaguyod Remediation Program was implemented. Due to their high absenteeism, low final test scores, and frequently poor performance on both written and practical examinations, these students were classified as at risk of failing. Constructivist learning theory (Piaget, 1972; Vygotsky, 1978) served as the foundation for the Mathaguyod Program, which offered scaffolded instruction designed to fill student learning gaps by progressively expanding on their prior skills and knowledge. Through targeted exercises and guided practice within their Zone of Proximal Development (ZPD), as defined by Vygotsky, students demonstrated measurable academic improvement by performing tasks and solving arithmetic problems that they were unable to complete on their own (Kang & Choi, 2018).

These results are in line with earlier research that highlighted the value of structured remediation programs for children who struggle. For example, Masengesho and Andala (2024) observed comparable success in improving the performance of slow learners through remedial teaching, while Brower et al. (2017) demonstrated that scaffolded interventions lead to improved academic outcomes for at-risk learners in mathematics. Additionally, the Mathaguyod Program's use of repeated practice and ongoing feedback aligns with the findings of Ajogbeje and Alonge (2012), who discovered that feedback-oriented remediation greatly improves student performance. According to Bruner's (1976) theory of scaffolding, which holds that learners develop understanding at different rates depending on instructional support and readiness, the variability observed in the post-test scores suggests individual differences in how students responded to the program.

The benefits of the Mathaguyod Program increase the relevance of constructivist-based education in resolving educational challenges. Boaler (2016) asserts that involving students in inquiry-driven, scaffolded learning enhances mathematical proficiency and cultivates a growth attitude, especially in those who struggle at first. The results also concur with those of Moser Opitz et al. (2017), who showed that targeted intervention programs can successfully address students' ongoing challenges with mathematics learning. The overall findings support Slavin's (2018) argument that structured, research-based educational interventions are crucial for improving academic achievement among students who are performing below expectations. Therefore, this study offers compelling empirical proof that well-organized, theory-based remediation programs, such as Mathaguyod, can greatly improve junior high school students who are at risk in their academic performance in mathematics.

**Conclusion**

This study's findings affirm that a structured Mathaguyod program can markedly enhance the mathematics ability of junior high school students. The significant increase in post-test scores indicates the program's efficacy in mitigating existing learning deficiencies. These findings correspond with the tenets of Constructivist Learning Theory, which emphasizes the significance of active, reflective, and scaffolded training in fostering profound conceptual comprehension and academic success.

**Recommendation**

Based on the findings of this study, it is recommended that schools implement a structured Mathaguyod program to support students who are struggling in mathematics. Even short-term interventions, such as the two-week program used in this research, can significantly improve learners’ academic performance. Teachers should be equipped with well-designed learning modules that are grounded in educational theories like Constructivist Learning Theory, which emphasizes active engagement, meaningful learning experiences, and instructional strategies that build on students’ prior knowledge. Early identification of at-risk students is essential so that timely interventions can be provided. Training teachers in effective remedial strategies and incorporating collaborative activities such as peer tutoring can further enhance the impact of these programs. Further research is encouraged to explore the long-term effects of remediation and its application in other subjects and educational settings.

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**References**

Du, K., & Lipscomb, T. J. (2023). The Effects of a Mathematics Remedial Program on Mathematics Success and Achievement among Beginning Mathematics Major Students: A regression discontinuity analysis. *Journal of Research in Science, Mathematics and Technology Education*, *6*(1), 21-39.

Brower, R. L., Woods, C. S., Jones, T. B., Park, T. J., Hu, S., Tandberg, D. A., ... & Martindale, S. K. (2018). Scaffolding mathematics remediation for academically at-risk students following developmental education reform in Florida. *Community College Journal of Research and Practice*, *42*(2), 112-128.

Kang, J. M., & Choi, C. W. (2018). A Study on Mathematics Teaching and Learning Program based on Zone of Proximal Development of Vygotsky. *East Asian mathematical journal*, *34*(4), 339-358.

James, A. O., & Folorunso, A. M. (2012). Effect of Feedback and Remediation on Students' Achievement in Junior Secondary School Mathematics. *International Education Studies*, *5*(5), 153-162.

Dela Cruz, G. T. (2024). Math-Saya ang Bakasyon: A remediation program for students with mathematics difficulties. Galaxy International Interdisciplinary Research Journal, 12(3), 428–437.

Dumigsi, M. P., & Cabrella, J. B. B. (2019). Effectiveness of strategic intervention material in Mathematics as remediation for grade 9 students in solving problems involving quadratic functions. *Asian Journal of Education and Social Studies*, *5*(1), 1-10.

Moser Opitz, E., Freesemann, O., Prediger, S., Grob, U., Matull, I., & Hußmann, S. (2017). Remediation for students with mathematics difficulties: An intervention study in middle schools. *Journal of learning disabilities*, *50*(6), 724-736.

Piaget, J. (1972). *The psychology of the child*. (H. Weaver, Trans.). Basic Books. *(Original work published 1966)*

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes* (M. Cole, V. John-Steiner, S. Scribner, & E. Souberman, Eds.). Harvard University Press.

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

Masengesho, D., & Andala, H. (2024). The Effect of Remedial Program Practices on the Academic Performance of Slow Learners in Mathematics Subject in Public Lower-Day Secondary School in Rwanda: A Case of Kirehe District. *African Journal of Empirical Research*, *5*(4), 945-956.

 Wood, D., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of child psychology and psychiatry*, *17*(2), 89-100.

 Duflo, E., Kiessel, J., Lucas, A., & Sabarwal, S. (2019). The impact of government-run remedial education programs on student learning in Ghana. *Abdul Latif Jameel Poverty Action Lab*.

 Allanigue, R. E. (1989). The effects of a proposed remedial program in algebra on the academic achievement of first year high school student of Benedictine Abbey School: school year 1988-1989.

 Dimatacot, G. T., & Parangat, K. B. (2022). Effectiveness of Cooperative Learning On the Academic Performance in Mathematics of Junior High School Students in the Philippines. *International Journal of Computer Engineering in Research Trends*, *9*, 51-58.

 Fraenkel, J., Wallen, N., & Hyun, H. (1993). *How to Design and Evaluate Research in Education 10th ed*. McGraw-Hill Education.

 Boaler, J. (2022). *Mathematical mindsets: Unleashing students' potential through creative mathematics, inspiring messages and innovative teaching*. John Wiley & Sons.

 Angraini, L. M., Kania, N., & Gürbüz, F. (2024). Students' Proficiency in Computational Thinking Through Constructivist Learning Theory. *International Journal of Mathematics and Mathematics Education*, *2*(1), 45-59.

 Winget, M., & Persky, A. M. (2022). A practical review of mastery learning. *American journal of pharmaceutical education*, *86*(10), ajpe8906.

 Wood, D., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of child psychology and psychiatry*, *17*(2), 89-100.