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Project Clear: Boosting Academic Achievement in Mathematics for Grade 5 Students

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Abstract— This quasi-experimental research aimed to determine the effectiveness of Project CLEAR in the academic performance of the students of Grade 5 students in Lenga Elementary School, Tadian, Mt. Province. Participants of the study were 20 Grade 5 students of Lenga Elementary School. Participants were chosen through the result of their quarter 2 grades in Mathematics. The study employed quantitative research methodology. Purposive sampling method was used to select the research participants. Students who scored below the passing mark in the class attended the remedial class in Mathematics 6. The instruction lasted for six weeks. Quantitative data were collected through pretest and posttest. The quantitative data were analyzed and interpreted using inferential statistics t-test, mean and standard deviation. The finding on students learning achievement showed that the post test scores of the students were higher than the pretest scores with the significant value, p=0.00. The findings revealed that the remedial classes were effective. Therefore, remedial class should be implemented in any instruction for more effective outcomes.

Keywords— Project CLEAR, Academic performance, Mathematics, Remedial class, Effectiveness.

1.INTRODUCTION

Mathematics is a fundamental part of human thought and logic, and integral to attempts at understanding the world and ourselves. Mathematics provides an effective way of building mental discipline and encourages logical reasoning and mental rigor. In addition, mathematical knowledge plays a crucial role in understanding the contents of other school subjects such as science, social studies, and even music and art. (The Role of Mathematics in the Overall Curriculum International Mathematical Union (IMU), n.d.) Despite the innovations made by the international and local education system, students still considered mathematics the most challenging subject (Escarez & Ching, 2022). According to the PISA report released on December 5, 2023, the average scores for mathematics among countries participating in the 2022 assessment were 472. However, the Philippines' score in the 2022 assessment were notably lower, with 355 in mathematics. This indicates a substantial gap of approximately 117 points below the international average. The OECD suggests that for every 20 points below the average, there is a corresponding lag of one year in the annual pace of learning among 15-year-olds in countries participating in the PISA. PISA 2022 Results (Volume I).

Computer technologies and other aspects of digital culture have changed the ways people live, work, play, and learn, impacting the construction and distribution of knowledge and power around the world. (Deuze, M. 2006) In some contexts, ICT has also become integral to the teaching-learning interaction, through such approaches as replacing chalkboards with interactive digital whiteboards, using students' own smartphones or other devices for

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learning during class time, and the "flipped classroom" model where students watch lectures at home on the computer and use classroom time for more interactive exercises. (IIEP-UNESCO).

As we stand on the precipice of a digital era, the traditional paradigms of teaching mathematics are being challenged, inviting a critical examination of the efficacy of various instructional approaches. In the contemporary educational landscape, the swift evolution of technology has ushered in a new era, reshaping the way students engage with academic subjects. Mathematics, often regarded as a cornerstone of education, is no exception to this transformative wave. The integration of digital tools and pedagogical innovations has become imperative for educators striving to equip junior high school students with the necessary skills and knowledge in the face of rapid technological evolution. No single strategy or programmatic focus showed any clear advantage compared with another. Comprehensive interventions combining cognitive, behavioral, and affective components were more effective than single-focus interventions. (Roter et al., 1998).

Given the challenges the COVID-19 outbreak created while schools were closed, it is even more crucial to provide adolescents with help so they may develop selfcontrol. For instance, the Chinese Ministry of Education has advised teachers to help students by giving them guidance and support "to scientifically design homebased learning plans, rationally select resources, and focus on building students' independent learning ability" (Zhou et al., 2020). This study sets out to undertake a comparative examination, exploring the necessity of remedial sessions to ensure that students are adequately prepared to progress without compromising their foundational understanding of Mathematics. This study aims to find out the Effectiveness of remedial classes in assessing Grade 5 students' Quarter 3 performance of of the students. Specifically, the study aims to answer the following question: What is the significant difference in the mathematics grades of Grade 5 students before and after the implementation of the remedial classes? By scrutinizing these elements within the context of the ever-evolving technological landscape, our study aims to contribute insights that will inform educators, curriculum developers, and policymakers in their efforts to design and support effective programs in Mathematics that can help build a child's self-worth and to create a more profound, engaging, and efficient learning journey.

In today's globalized world, where good computing skills in Mathematics are highly valued across a range of sectors, Mathematics proficiency is essential. To better prepare students for future difficulties, many educational institutions and policymakers are concentrating on improving numeracy ability among pupils. The usefulness of project CLEAR in enhancing Grade 5 students' Mathematics competence is examined in this review of relevant literature.

Teachers are crucial to students' opportunities to learn mathematics (Ball et al., 2008). They determine how much time will be devoted to a subject, set and communicate standards and expectations, and decide which topics will be the focus of student learning (Hawley & Valli, 1999; Schwille et al., 1983). As technology rapidly advances, educational processes undergo substantial changes, resulting in a battle for students' attention between social media and academic instruction. These abrupt changes have impacted educators, students, parents, and other stakeholders. This new scenario necessitates quick modifications. Following the Department of Education's, No Child Left Behind policy was adopted by the Department of Education (DepEd) in the Philippines, it is critical to

ensure that kids continue to have access to high-quality education despite the continuously changing and challenging learning environment.

One of the biggest problems teachers are facing right now is that most students are struggling to understand what they have read and, regrettably, are unable to read even a simple phrase. (Saro, et al., 2023). However, despite of endeavor to educate all children, statistics show that the International Test Standard results consistently show Filipino students lagging way behind practically everybody else in the world. In addition, due to the magnitude of the act, the pressure on teachers has increased to immeasurable proportions. Further, evidence shows that the act has not only negatively affected perceptions of teachers' cooperation but positively affected feelings of classroom control. (Rebusa et al., 2022; Ebarle, 2023).

According to E.H Billow, remedial teaching is morale building and an interest building enterprise for students. The purpose of remedial teaching is the development of effective techniques for the correction of errors in all types of learning. Comparing placement in remediation to academically similar peers who were exempt from taking remedial courses, Saro et al, (2023) discovered that placement in remediation improved the likelihood of continuing in college. This was also supported by the conclusions from qualitative data, (Rai, et al., 2022) which suggested that remedial class had a favorable influence, and students were quite satisfied with it. As a result, remedial classes should be included in every course to achieve better results. The research utilizes the constructivism theory. Paris (2012) argues that constructivism suggests that the most efficient way for pupils to learn is by connecting mathematical ideas to real-world occurrences that are shown in films. Through the process of linking theoretical concepts with concrete illustrations, learners may cultivate a more profound comprehension of ideas and actively engage in their own educational journey. In addition, Lorbis (2019) highlights that Bruner's constructivist approach underscores the notion that learning is a dynamic process in which learners actively build upon their prior knowledge to form new concepts. They use cognitive processes to choose and alter information, develop hypotheses, and reach choices. The researcher seeks to include these ideas in the study design to create a learning environment that promotes meaningful engagement with fraction concepts. This will be achieved via contextualized video clips, collaborative activities, and reflective practices.

According to multimedia learning theory, learning is improved when material is delivered in both audiovisual and visual media. With the use of multimedia components including text, music, and images, contextualized video classes give learners several ways to efficiently assimilate knowledge (Mayer, 2019). By using video clips, there will be an interactive and engaging learning experience for the students, which could lead to improved numeracy skills.

The improvement of literacy and numeracy programs and the integration of 'peace competencies' will be some of the priorities of the Department of Education (DepEd) in making the K to 12 curricula relevant to produce job-ready, active and responsible citizens. (DepEd, 2024). Project CLEAR is a short-term tutoring intervention for students who are struggling with math, both individually and in small groups. Math teachers are helped by the Mathematics Club members who collaborate and assist students to create a friendly environment and strategic instruction to meet the needs of each individual student. When students meet grade-level expectations and

demonstrate their ability to work independently in the classroom, they are given the option to join or not but are closely monitored to ensure academic success.

2. Materials and Methods

Research Design

The study employed a descriptive and one-group experimental design, with pre- and post-tests utilized to collect data on the performance of student-respondents on the mathematical concepts and competencies in Grade 5. According to Devin Kowalczyk (2015), a pre-test-post-test design is often a one-group experiment in which participants are investigated before and after doing the experiment. A one- group experiment simply implies that participants were not randomized at random. It is feasible to have a control group that does not use the technology.

There is just one group in the pre-test and post-test designs, and they are all in the experimental condition.

Research Respondents

The respondents of the study were twenty (20) of Grade 5 students the second quarter of the School Year 2023 - 2024. The contextualized teaching guide and localized instructional materials were the main instruments of this study. The self-constructed contextualized teaching guide and localized instructional materials were given to the Grade 5 students through worksheets.

Research Instruments

The students were given 2 worksheets per week, giving them a total of 10 worksheets during the duration of the project. They were based on the learning competencies covered in the topics on Basic Math. The quarter 2 Math grades assessed the students' prior Math competency. After the administration of the contextualized teaching guides and localized instructional materials. The K–12 curriculum's specified competencies are being mastered by the students with the use of these instructional tools, which also assist the instructor in correcting ideas and abilities. The study utilizes pre- and post-test. These assessments in Mathematics were administered to pupils in Grade 5 and included a 10-item test. This displays the results of the pre- and post-test given to the pupils.

Statistical Treatment of Data

The following statistical methods were used in the investigation. To determine values relevant to statistical notions of analyses, a formula was utilized. Based on the results of the pre- and post-tests before and after the use of PROJECT CLEAR, percentage distribution was used to describe the student-respondents' performance in Mathematics. Data transformations that assign numerical or ordinal values according to their rank after the data have been sorted are known as ranking. To describe the degree of difference across a group, standard deviation was used. To determine if there was a significant difference in the students' performance on the pre-test and post-test of the mathematics exam, the Z-test for correlated samples was used.

Data Gathering Procedure

The researchers chose the competencies from the Grade 5 K–12 Curriculum's least-mastered skills to serve as the content anchors for the project CLEAR. Prior to the start of the study, the student respondents took the pre-test.

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The Project CLEAR was presented to the experimental group, and following the lesson, a post-test was administered.

3.RESULTS AND DISCUSSIONS

This chapter presents the data analyses and interpretations yielded. Specifically, the discussion revolves around the Effectiveness of Project CLEAR in Assessing Grade 5 students' Quarter 3 Academic performance of Lenga Elementary School year 2023-2024. The findings of the study will be the basis for the proposed improvement plan.

Table 1. Frequency and Percentage of Distribution of Pre-Test Scores of Grade 5 Students

Scores	Frequency	Percentage
1 – 5	2	10
6 – 10	2	10
11 – 15	0	0
16 – 20	7	35
21 – 25	6	30
26 - 30	3	15
Total	20	100

Table 1 presents the percentage of distribution of pre-test scores of Grade 5 students. Out of 20 students, there are two students each (10%) who got the score of 1-5 and 6-10, no students got the score of 11-15, seven (35%) got the score of 16-20, six (30%) got the score of 21-25, and three (15%) got the score of 26-30.

Table 2. Frequency and Percentage of Distribution of Post-Test Scores of Grade 5 Students

Scores	Frequency	Percentage
21 – 25	1	5
26 – 30	3	15
31 – 35	9	45
36 – 40	6	30
41 – 45	1	5
Total	20	100

Presented in Table 2 is the percentage of distribution of post test scores of Grade 5 students. Out of 20 students, there is one student (5%) who got the score of 21-25, three students (15%) got the score of 26-30, nine (45%) got the score of 31-35, six (30%) got the score of 36-40, and one (5%) got the score of 41-45.

Table 3. Mean and Standard Deviation of Pre-Test and Post Test Scores of Grade 5 Students

	N	Mean	Standard Deviation
Pre Test	20	19.5	7.63
Post Test	20	33.3	4.73

The mean and standard deviation of pre-test and post-test scores are showcased in Table 3. Both tests have 20 students as participants of the study. The mean of pre-test scores is 19.5 with standard deviation of 7.63. Post test scores gathered a mean of 33.3 with standard deviation of 4.73. The mean post test score is higher than the mean pre-test score, suggesting that the performance of Grade 5 students was improved. Lower standard deviation of post test scores compared to the pre-test scores implies that the post-test scores of Grade 5 students are not far away from the mean.

Table 4. Difference between Pre-Test and Post Test Scores of Grade 5 students

Pre-Test Scores		**Post Test Scores**		**t**	**df**	**p**
M	SD	M	SD			
19.5	7.63	33.3	4.73	-7.37	19	< .001

Table 4 shows the results of paired sample t-test which was used to determine whether there is a significant difference between the pre-test and post test scores. As shown in the table, when the pre-test scores (M = 19.5, SD = 7.63) and the post test scores (M = 33.3, SD = 4.73) were compared, there is a significant difference between the two; $t(19) = -7.37$, $p < 0.001$.

The study aims to determine the effectiveness of remedial classes in the academic performance of Grade 5 students. 20 students are selected to be the participants of the study that took a pre-test, attended the remedial class, and took the post-test after the program. The scores of students are then collected and compared to see if there is a difference between the pre-test and post test scores.

Data analysis was conducted to summarize and make findings of the data gathered. The mean and standard deviation was used to compare the values of the two tests. Paired sample t-test was also used to determine the difference between pre-test and post test scores of 20 students. The following observations derived from the analysis are as follows:

The mean of post test scores (M = 33.3) is greater than the mean of pre-test scores (M = 19.5). This suggests that the performance of students after taking the remedial class was improved. Remedial classes have a positive impact on a student's academic performance. Yolak et al. (2019) stated that these remedial courses had academic, social, psychological, economic, and career development impacts on students' lives. Additionally, he said that through these programs, the students' academic performance has improved, and their class participation increased. With the onset of the different activities provided to the students to increase the academic performance, Sebullen (2023) highlighted that the role of the teacher in most cases is crucial in the preparation of these activities to ensure that these are relevant targeting the needs of the learners.

The standard deviation of post test scores (SD = 4.73) is less than the standard deviation of pre-test scores (SD = 7.63). This indicates that the post test scores are much closer to the mean compared to the pre-test scores which are far more scattered from each other. This revealed that remedial class enhanced the learning achievement of students. Sebullen (2023) highlighted that with the well planned activities for the students, it cannot deny the fact

Volume: 03 / Issue: 06 / 2024 - Open Access - Website: www.mijrd.com - ISSN: 2583-0406

that the teacher is knowledgeable of their needs and imply greater efforts in delivering instruction well with appropriate instructional materials, intervention as well as reinforcements.

There is a significant difference between the pre-test scores and post test scores; $t(19) = -7.37$, $p < 0.001$. This proves the first finding that the performance of students after taking the remedial class was improved and the program was found to be effective.

4. FINDINGS, CONCLUSIONS, RECOMMENDATIONS

Findings

The data analysis from the Project CLEAR study shows a significant improvement in the academic performance of Grade 5 students at Lenga Elementary School, as evidenced by the increase in post-test scores (mean = 33.3) compared to pre-test scores (mean = 19.5), and a statistical significance with a p-value less than 0.001 in the paired sample t-test.

The post-test scores demonstrated a tighter clustering around the mean (standard deviation = 4.73) compared to the pre-test scores (standard deviation = 7.63), indicating more consistent student performance after attending the remedial classes, which suggests the effectiveness of the remedial program in enhancing academic outcomes.

Conclusions

The significant improvement in the mean scores from the pre-test to the post-test demonstrates that the remedial classes were effective in enhancing the academic performance of Grade 5 students at Lenga Elementary School. This suggests that targeted instructional interventions can successfully address learning gaps and improve educational outcomes.

The reduction in the standard deviation from the pre-test scores to the post-test scores indicates a more uniform level of performance among the students following the remedial classes. This consistency points to the effectiveness of the remedial program in not only improving scores but also in making learning achievements more uniform across the student group.

The results of the paired sample t-test, which showed a significant difference between the pre- and post-test scores, confirm the positive impact of the remedial classes on student learning outcomes. This statistical backing reinforces the value of remedial education programs in providing necessary support to students who may be struggling academically.

Recommendations

Based from the findings and conclusions, the following recommendations are respectfully presented:

In-depth research on a similar topic may be conducted to factor in additional variables that may affect the academic performance of Grade 5 students.

Future researchers may gather more participants to strengthen the results that they may gather from the study.

Future research on similar topics should be conducted in different subjects to compare if the results are consistent with the current study.

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Volume: 03 / Issue: 06 / 2024 - Open Access - Website: www.mijrd.com - ISSN: 2583-0406

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