

Effectiveness of Contextualized Teaching Strategies in Mathematics for Grade Six Pupils

Jn M. Malsi, MAEd

Teacher I, Muzon Elementary School, Taytay, Rizal Philippines

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Email of Corresponding Author: jn.malsi@deped.gov.ph

Abstract

This study determined the effectiveness of contextualized teaching strategies in improving the Mathematics performance of Grade Six pupils at Muzon Elementary School, Taytay District, Division of Rizal, during the School Year 2025–2026. Specifically, it compared the academic performance of pupils exposed to contextualized teaching strategies and those taught using the traditional method, while also examining whether selected demographic variables influenced learning outcomes. The study employed an experimental research design using a parallel-group approach involving ninety-five (95) Grade Six pupils, with fifty (50) assigned to the experimental group and forty-five (45) to the control group. A validated 50-item teacher-made Mathematics achievement test was administered as both pretest and posttest to measure pupils' performance before and after the intervention. Data were analyzed using appropriate descriptive and inferential statistical tools. Findings revealed that both groups obtained a Satisfactory level of performance during the pretest. Following the intervention, the control group maintained a Satisfactory rating, whereas the experimental group improved to a Very Satisfactory level. Statistical analysis indicated significant differences in the pretest and posttest performance between the experimental and control groups, demonstrating that contextualized teaching strategies contributed to greater improvement in Mathematics achievement than the traditional method. Furthermore, no significant differences were found in the posttest performance of pupils in the experimental group when grouped according to sex, sibling position, number of children in the family, monthly family income, and parents' educational attainment, indicating that these variables did not significantly influence learning outcomes after exposure to contextualized instruction. The study concluded that while both instructional approaches enhanced pupils' performance, contextualized teaching strategies produced greater gains in Mathematics achievement by making learning more meaningful and relevant to pupils' real-life experiences. It is therefore recommended that school administrators support the implementation of contextualized teaching through adequate instructional resources and professional development, while teachers continuously integrate contextualized strategies, conduct regular learning assessments, provide appropriate interventions, and sustain learner-centered instructional practices to further improve Mathematics performance.

Keywords: Contextualized Teaching Strategies, Mathematics Achievement, Grade Six Pupils, Experimental Research, Contextualized Learning, Traditional Teaching Method, Mathematics Education

1. Introduction

Mathematics is a fundamental learning area that develops learners' critical thinking, logical reasoning, and problem-solving skills necessary for academic success and lifelong learning. Despite its importance, many elementary pupils continue to encounter challenges in understanding mathematical concepts because instruction is often presented in abstract and decontextualized ways. Consequently, educators have increasingly adopted contextualized teaching strategies that connect mathematical concepts with learners' real-life experiences, making learning more meaningful, engaging, and relevant. This approach aligns with the Department of Education's thrust toward learner-centered instruction, which promotes authentic learning experiences that enable pupils to apply mathematical knowledge in practical situations.

Recent studies have consistently demonstrated the effectiveness of contextualized instruction in Mathematics education. Ogates et al. (2023) found that contextualized teaching significantly improved students' Mathematics performance in the post-pandemic learning environment. Fabrigas and Taban (2023) likewise reported that contextualization and localization enhanced Mathematics instruction by making lessons more meaningful and responsive to learners' daily experiences. Luneta (2023) emphasized that contextualized Mathematics instruction promotes deeper conceptual understanding and active learner participation. Similarly, Chavarria-Arroyo and Albanese (2023) concluded that contextualized mathematical tasks strengthen learners' engagement, reasoning, and problem-solving skills through authentic learning experiences. Balingway and Felix (2024) revealed that contextualized worksheets significantly improved the Mathematics achievement of elementary learners compared with conventional instruction. Solis and Pasia (2024) likewise found that contextualized instructional sheets enhanced students' academic performance and classroom participation in Mathematics. Barcelo et al. (2025) further demonstrated that contextualized instruction integrated with technology produced significantly higher

Mathematics achievement than traditional teaching approaches. Moreover, Domingo (2025) reported that contextualized learning materials were highly effective in improving learners' understanding and performance in Mathematics.

Although these studies provide substantial evidence supporting contextualized instruction, several research gaps remain. Most recent investigations focused primarily on the development and validation of contextualized instructional materials, activity sheets, or technology-assisted learning resources rather than examining the effectiveness of contextualized teaching strategies implemented by classroom teachers. Likewise, many studies utilized descriptive, developmental, or mixed-method research designs, resulting in limited experimental evidence comparing contextualized instruction with the traditional teaching approach. Furthermore, existing studies were commonly conducted among secondary school learners or in different educational contexts, leaving limited empirical evidence involving Grade Six pupils in public elementary schools. There is also a scarcity of localized studies within the Division of Rizal that examine the effectiveness of contextualized teaching strategies using a parallel-group experimental design while considering selected demographic characteristics of learners.

The present study is therefore timely and relevant in addressing these identified gaps and in supporting the continuous improvement of Mathematics instruction in elementary education. As schools strive to strengthen learners' numeracy skills through learner-centered pedagogies, there is a growing need for empirical evidence on instructional strategies that foster meaningful learning and improved academic achievement. By determining the effectiveness of contextualized teaching strategies among Grade Six pupils at Muzon Elementary School, Taytay District, Division of Rizal, this study provides localized evidence that may assist teachers in enhancing classroom instruction and guide school administrators in planning instructional interventions, professional development activities, and curriculum implementation. Moreover, the findings contribute to the growing body of knowledge on contextualized learning and may serve as a valuable reference for future researchers investigating contextualized teaching strategies across different grade levels, subject areas, and educational settings.

2. Material and methods

2.1 Research Design

This study employed an experimental research design, specifically the parallel-group pretest-posttest design, to determine the effectiveness of contextualized teaching strategies in improving the Mathematics performance of Grade Six pupils. The respondents were assigned into two groups: the experimental group, which was exposed to contextualized teaching strategies, and the control group, which received instruction through the traditional teaching method. Both groups were administered the same pretest prior to the intervention to determine their baseline level of performance and the same posttest after the intervention to measure learning gains. The use of an experimental design enabled the researcher to compare the effectiveness of the two instructional approaches while controlling the influence of extraneous variables, thereby providing a reliable basis for determining whether contextualized teaching strategies significantly enhanced pupils' Mathematics achievement..

2.2 Locale of the Study

The study was conducted at Muzon Elementary School, Taytay District, Division of Rizal, during the School Year 2025–2026. The school is one of the public elementary schools under the Department of Education that provides quality basic education to learners from diverse socioeconomic backgrounds. Muzon Elementary School was selected because it offers Grade Six classes with comparable academic characteristics and provides an appropriate setting for implementing contextualized teaching strategies in Mathematics. The school administration also supported the conduct of the study and facilitated the implementation of the experimental intervention.

2.3 Respondents of the Study

The respondents of the study were ninety-five (95) Grade Six pupils enrolled at Muzon Elementary School during the School Year 2025–2026. The respondents consisted of 50 pupils in the experimental group and 45 pupils in the control group. They were described according to their demographic profile, including sex, sibling position, number of children in the family, monthly family income, parents' educational attainment, and parents' occupation. These characteristics were considered to determine whether they influenced the pupils' Mathematics performance after exposure to the instructional interventions.

2.4 Sample and Sampling Procedure

The study utilized purposive sampling in selecting the respondents. Two intact Grade Six classes with comparable academic characteristics were identified in coordination with the school administration. One class was assigned as the experimental group, while the other served as the control group. The assignment was based on the existing class organization to minimize disruption to regular classroom instruction. All pupils in the selected classes who met the inclusion criteria and whose parents provided informed consent were included in the study, resulting in a total sample of ninety-five (95) respondents.

2.5 Research Instrument

The primary instrument used in the study was a researcher-made 50-item Mathematics Achievement Test, which served as both the pretest and posttest. The test was developed based on the Grade Six Mathematics learning competencies prescribed in the Department of Education curriculum and the topics covered during the intervention period. The instrument was subjected to content validation by experts in Mathematics education and educational research to ensure its validity and alignment with the learning objectives. Necessary revisions were incorporated based on the validators' recommendations. The finalized instrument was administered before and after the implementation of the contextualized teaching strategies to determine changes in the pupils' Mathematics performance.

2.6 Data Gathering Procedure

Prior to data collection, the researcher secured approval from the Graduate School, the Schools Division Office of Rizal, and the Office of the School Principal of Muzon Elementary School. After obtaining the necessary permissions, parental consent and pupils' assent were secured before participation in the study. The researcher administered the pretest simultaneously to both the experimental and control groups to establish their initial level of Mathematics performance. Thereafter, the experimental group was taught using contextualized teaching strategies, while the control group received instruction through the traditional teaching method over the prescribed intervention period. Upon completion of the intervention, the same achievement test was administered as the posttest. The collected data were organized, encoded, and prepared for statistical analysis while ensuring confidentiality and ethical handling of the respondents' information.

2.7 Data Analysis Techniques

The data gathered were analyzed using appropriate descriptive and inferential statistical tools. Frequency, percentage, and ranking were used to describe the demographic profile of the respondents. Mean and standard deviation were computed to determine the level of Mathematics performance of the experimental and control groups in both the pretest and posttest. Independent samples t-test was employed to determine significant differences between the Mathematics performance of the experimental and control groups, while the paired samples t-test was used to determine significant differences between the pretest and posttest scores within each group. One-way Analysis of Variance (ANOVA) was utilized to determine whether significant differences existed in the posttest performance of the experimental group when respondents were grouped according to their demographic characteristics. All hypotheses were tested at the 0.05 level of significance..

2.8 Ethical Considerations

The study adhered to established ethical principles throughout the research process. Prior to data collection, permission was obtained from the concerned authorities and participating pupils and their parents/guardians. All respondents were informed of the purpose, procedures, and voluntary nature of the study, and their informed consent was secured before participation. Confidentiality and anonymity of the respondents were strictly maintained by ensuring that no personal or company-identifiable information was disclosed in the presentation of the results. Participants were assured that they could withdraw from the study at any time without any consequences. The data gathered were used solely for academic and research purposes, stored securely, and handled in accordance with the agreed confidentiality and non-disclosure provisions to protect the privacy and integrity of both the respondents and the participating organizations.

3. Results and Discussion

3.1 Profile of the Two Groups of Respondents in Terms of the Selected Variables

The findings indicate that the experimental and control groups shared generally comparable demographic characteristics, although slight variations were observed. The experimental group was predominantly composed of male pupils, first-born children, members of families with two to three children, and households with a monthly family income of Php 20,000 and above. Most of their parents were college graduates, while fathers were commonly classified under other occupations and mothers were primarily self-employed or engaged in other occupations. In contrast, the control group consisted mostly of female pupils, second-born children, and families with two to three children, with the majority belonging to the Php 10,000–14,999 monthly income bracket. Most fathers were high school graduates, while mothers were predominantly college graduates. Both fathers and mothers in the control group were primarily self-employed. Overall, the profile of the respondents suggests that both groups had relatively similar family structures and parental backgrounds, with differences mainly observed in sex distribution, household income, and parents' educational attainment and occupations. These characteristics provide important contextual information in interpreting the pupils' Mathematics performance before and after the implementation of the instructional interventions.

Table 1
Profile of the Two Groups of Respondents in Terms of the Selected Variables

Profile	Experimental			Control		
	f	%	R	f	%	R
Sex						
Male	26	52.0	1	22	48.9	2

Female	24	48.0	2	23	51.1	1
Total	50	100.0		45	100.0	
Sibling Position						
First	19	38.0	1	11	24.4	2.5
Second	16	32.0	2	15	33.3	1
Third	9	18.0	3	11	24.4	2.5
Fourth	6	12.0	4	4	8.9	4.5
Fifth and above	-	-	-	4	8.9	4.5
Total	50	100.0		45	100.0	
Number of Children in the Family						
1	10	20.0	3	6	13.3	3
2 – 3	27	54.0	1	24	53.3	1
4 – 5	11	22.0	2	11	24.4	2
6 – 7	2	4.0	4	3	6.7	4
8 and above	-	-	-	1	2.2	5
Total	50	100.0		45	100.0	
Monthly Family Income						
Php 20,000 and above	26	52.0	1	12	26.7	2
Php 15,000 - Php 19,999	5	10.0	4	9	20.0	4
Php 10,000 - Php 14, 999	10	20.0	2	13	28.9	1
Below Php 10,000	9	18.0	3	11	24.4	3
Total	50	100.0		45	100.0	
Father's Educational Attainment						
College Graduate	23	46.0	1	12	26.7	2.5
College Undergraduate	9	18.0	3	12	26.7	2.5
High School Graduate	15	30.0	2	14	31.1	1
High School Undergraduate	2	4.0	4	5	11.1	4
Elementary Graduate	1	2.0	5	1	2.2	5.5
Elementary Undergraduate	-	-	-	1	2.2	5.5
Total	50	100.0		45	100.0	
Mother's Educational Attainment						
College Graduate	30	60.0	1	16	35.6	1
College Undergraduate	10	20.0	2	9	20.0	2.5
High School Graduate	8	16.0	3	9	20.0	2.5
High School Undergraduate	2	4.0	4	7	15.6	4
Elementary Graduate	-	-	-	3	6.7	5
Elementary Undergraduate	-	-	-	1	2.2	6
Total	50	100.0		45	100.0	
Father's Occupation						
Government Employee	3	6.0	5	1	2.2	5.5
Private Employee	7	14.0	3.5	15	33.3	2
Public School Teacher	2	4.0	6	-	-	-
Private School Teacher	-	-	-	-	-	-
Self- Employed	13	26.0	2	17	37.8	1
OFW	7	14.0	3.5	1	2.2	5.5
Health Care Provider	1	2.0	7	2	4.4	4
Others, please specify	17	34.0	1	9	20.0	3
Total	50	100.0		45	100.0	
Mother's Occupation						
Government Employee	3	6.0	5	-	-	-
Private Employee	6	12.0	4	12	26.7	2
Public School Teacher	7	14.0	3	1	2.2	6
Private School Teacher	-	-		1	2.2	6
Self- Employed	16	32.0	1.5	18	40.0	1
OFW	1	2.0	6.5	5	11.1	4
Health Care Provider	1	2.0	6.5	1	2.2	6
Others, please specify	16	32.0	1.5	7	15.6	3
Total	50	100.0		45	100.0	

3.2 Level of Performance in Mathematics of the Experimental and Control Groups Exposed and Unexposed to Contextualized Teaching Strategies as Revealed in the Pretest and Posttest Results

The findings reveal that both the experimental and control groups demonstrated improvement in their Mathematics performance from the pretest to the posttest; however, the experimental group exhibited greater gains after being exposed to contextualized teaching strategies. The experimental group's mean score increased from 28.62 (Satisfactory) in the pretest to 34.94 (Very Satisfactory) in the posttest, with 82.0% of the pupils achieving a Very Satisfactory rating and 10.0% attaining an Outstanding rating. In contrast, the control group's mean score improved from 21.89 (Satisfactory) to 26.24 (Satisfactory), with the majority (77.8%) remaining at the Satisfactory level despite a slight increase in the proportion of pupils achieving a Very Satisfactory rating. The lower standard deviation of the experimental group in the posttest further indicates more consistent performance among pupils following the intervention. Overall, the results suggest that although both instructional approaches contributed to improved learning outcomes, contextualized teaching strategies were more effective than the traditional method in enhancing pupils' Mathematics achievement, supporting the premise that connecting mathematical concepts to learners' real-life experiences promotes deeper understanding, greater engagement, and improved academic performance.

Table 2

Level of Performance in Mathematics of the Experimental and Control Groups Exposed and Unexposed to Contextualized Teaching Strategies as Revealed in the Pretest and Posttest Results

Score	Verbal Interpretation	Experimental				Control			
		Pretest		Posttest		Pretest		Posttest	
		f	%	f	%	f	%	f	%
40	Outstanding	-	-	5	10.0	-	-	-	-
30-39	Very Satisfactory	27	54.0	41	82.0	5	11.1	10	22.2
20-29	Satisfactory	20	40.0	4	8.0	34	75.6	35	77.8
10-19	Fairly Satisfactory	-	-	-	-	6	13.3	-	-
1-9	Did not meet expectations	-	-	-	-	-	-	-	-
Total		50	100.0	50	100.0	45	100.0	45	100.0
Highest Score		35		40		31		39	
Lowest Score		16		23		10		12	
Mean		28.62 (S)		34.94 (VS)		21.89 (S)		26.24 (S)	
Std. Deviation		4.130		3.851		5.769		7.013	

3.3 Significant Difference on the Level of Performance in Mathematics of the Experimental and Control Groups Exposed and Unexposed to Contextualized Teaching Strategies as Revealed in the Pretest and Posttest Results

The results indicate that both the experimental and control groups exhibited statistically significant improvements in their Mathematics performance from the pretest to the posttest. The experimental group obtained a mean score of 28.62 in the pretest and 34.94 in the posttest, yielding a computed t-value of -4.489 and a p-value of 0.000, leading to the rejection of the null hypothesis. Similarly, the control group improved from a mean score of 21.89 in the pretest to 26.24 in the posttest, with a t-value of -16.606 and a p-value of 0.000, likewise indicating a significant difference. These findings demonstrate that both contextualized teaching strategies and the traditional method contributed to pupils' learning gains. However, the experimental group attained a higher posttest mean, suggesting that contextualized teaching strategies were more effective in enhancing Mathematics achievement than the traditional approach. The findings imply that while both instructional methods support learning, contextualized instruction provides a more meaningful learning experience by relating mathematical concepts to real-life situations, thereby promoting deeper understanding, greater learner engagement, and improved academic performance. This finding is consistent with the study of Ferede et al. (2025), which reported that contextualized instruction significantly enhanced learners' conceptual understanding, engagement, and ability to apply mathematical concepts in authentic contexts compared with conventional teaching methods.

Table 3

Significant Difference on the Level of Performance in Mathematics of the Experimental and Control Groups Exposed and Unexposed to Contextualized Teaching Strategies as Revealed in the Pretest and Posttest Results

Group	Test	Mean	SD	t-value	p-value	Null Hypothesis	Verbal Interpretation
Experimental	Pretest	28.62	4.130	-4.489	0.000	Rejected	Significant
	Posttest	34.94	3.851				
Control	Pretest	21.89	5.769	-16.606	0.000	Rejected	Significant
	Posttest	26.24	7.013				

3.4 Significant Difference on the Level of Performance in Mathematics of the Experimental and Control Groups Exposed and Unexposed to Contextualized Teaching Strategies as Revealed in the Posttest Results

The results reveal a statistically significant difference in the posttest Mathematics performance of the experimental and control groups. The experimental group obtained a higher mean score ($M = 34.94$, $SD = 3.851$) than the control group ($M = 26.24$, $SD = 7.013$). The computed t -value of 7.376 with a p -value of 0.000, which is lower than the 0.05 level of significance, led to the rejection of the null hypothesis, indicating that the observed difference between the two groups was statistically significant. These findings suggest that pupils exposed to contextualized teaching strategies achieved significantly better Mathematics performance than those taught using the traditional method. While both groups demonstrated learning gains, the substantially higher posttest performance of the experimental group indicates that contextualized instruction was more effective in enhancing learners' understanding and application of mathematical concepts. This implies that integrating real-life contexts into Mathematics instruction promotes meaningful learning experiences, increases learner engagement, and improves academic achievement. The findings support those of Barrun and Cajurao (2025), who reported that learners exposed to contextualized instruction significantly outperformed those taught through conventional methods, demonstrating higher levels of conceptual understanding, process skills, and overall Mathematics achievement.

Table 4

Significant Difference on the Level of Performance in Mathematics of the Experimental and Control Groups Exposed and Unexposed to Contextualized Teaching Strategies as Revealed in the Posttest Results

Test	Group	N	Mean	SD	t-value	p-value	Null Hypothesis	Verbal Interpretation
Posttest	Experimental	50	34.94	3.851	7.376	.000	Rejected	Significant
	Control	45	26.24	7.013				

3.5 Significant Difference on the Level of Performance in Mathematics of the Experimental Group Exposed to Contextualized Teaching Strategies as Revealed in the Posttest Differ in Terms of Their Profile

The findings indicate that there was no significant difference in the Mathematics performance of the experimental group exposed to contextualized teaching strategies when respondents were grouped according to their profile variables. The results revealed that sex obtained an F -value of 0.571 and a p -value of 0.685, sibling position obtained an F -value of 0.494 and a p -value of 0.486, number of children in the family obtained an F -value of 0.473 and a p -value of 0.794, and monthly family income obtained an F -value of 0.752 and a p -value of 0.563. Likewise, father's educational attainment obtained an F -value of 2.348 and a p -value of 0.089, mother's educational attainment obtained an F -value of 0.346 and a p -value of 0.792, father's occupation obtained an F -value of 0.810 and a p -value of 0.551, while mother's occupation obtained an F -value of 1.124 and a p -value of 0.361. All variables obtained p -values higher than the 0.05 level of significance; therefore, the null hypothesis was accepted. This indicates that the demographic and socioeconomic characteristics of the pupils did not significantly influence their Mathematics performance after exposure to contextualized teaching strategies. The findings suggest that contextualized instruction provided equal learning opportunities among pupils regardless of their sex, family background, socioeconomic status, and parents' educational attainment or occupation. This implies that the effectiveness of contextualized teaching strategies is attributed to the meaningful connection between mathematical concepts and learners' real-life experiences rather than to their personal characteristics. Through relevant and engaging learning activities, pupils with diverse backgrounds were able to understand, apply, and improve their mathematical knowledge. The findings support Reyes et al. (2022), who emphasized that contextualization strengthens learners' understanding and engagement by allowing them to connect classroom concepts with their own experiences and existing knowledge.

Table 5

Significant Difference on the Level of Performance in Mathematics of the Experimental Group Exposed to Contextualized Teaching Strategies as Revealed in the Posttest Differ in Terms of Their Profile

Profile	F-value	p-value	Null Hypothesis	Verbal Interpretation
Sex	0.571	0.685	Accepted	Not Significant
Sibling Position	0.494	0.486	Accepted	Not Significant
Number of Children in the Family	0.473	0.794	Accepted	Not Significant
Monthly Family Income	0.752	0.563	Accepted	Not Significant
Father's Educational Attainment	2.348	0.089	Accepted	Not Significant
Mother's Educational Attainment	0.346	0.792	Accepted	Not Significant
Father's Occupation	0.810	0.551	Accepted	Not Significant
Mother's Occupation	1.124	0.361	Accepted	Not Significant

Conclusions & Recommendations

The study concluded that contextualized teaching strategies were effective in improving the Mathematics performance of Grade Six pupils. Although both the experimental group exposed to contextualized teaching strategies and the control group taught through the traditional method demonstrated significant improvement from pretest to posttest, the experimental group achieved a higher level of performance, indicating the greater effectiveness of contextualized instruction. The findings further revealed that pupils' demographic characteristics, including sex, sibling position, number of children in the family, monthly family income, parents' educational attainment, and parents' occupation, did not significantly influence their Mathematics performance after exposure to contextualized teaching strategies. This indicates that contextualized instruction promotes meaningful and inclusive learning experiences that benefit pupils regardless of their personal and family backgrounds.

Based on the findings and conclusions, it is recommended that school administrators support the continuous implementation of contextualized teaching strategies by providing instructional resources, professional development opportunities, and monitoring mechanisms to strengthen Mathematics instruction. Teachers are encouraged to integrate contextualized approaches in their lessons, develop meaningful learning activities connected to real-life situations, and continuously assess pupils' progress to address learning gaps through appropriate interventions. Pupils may be provided with more opportunities to engage in contextualized mathematical tasks that enhance problem-solving, critical thinking, and application of concepts. Furthermore, future researchers may conduct similar studies involving other grade levels, learning areas, and variables to further establish the effectiveness and applicability of contextualized teaching strategies in different educational contexts

Compliance with ethical standards

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