TEACHING STRATEGIES USING THE MULTIMEDIA AND STUDENT'S ACADEMIC ACHIEVEMENT: AN EXPERIMENTAL STUDY

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ABSTRACT

Teaching strategies play an essential aspect in the teaching and learning process. Teachers have been considered individuals who play a vital role and are the key factor in the student's learning process. The main purpose of this study is to determine whether there is significant difference between traditional teaching and teaching using multimedia instruction in the academic achievement of the students in Camanlangan National High School. To this end, a quasi-experimental design was used, researcher identified two groups for this study. One of the groups is control group and the other group is experimental; each group consist of 35 students, 18 males and 17 females respectively. Traditional teaching or instruction was given to the control group and teaching using multimedia treated as experimental group. Both groups were subjected to pretest and posttest in the lesson tackled. The analysis of the posttest showed that there is no significant difference between the academic achievement of control and experimental group at a significance level of 0.05. The result was the academic achievement of both control and experimental rose in the posttest as a result in traditional teaching and using multimedia approach. The results also implied that the combination of traditional and using multimedia in teaching can be beneficial in teaching-learning process and they have shown a better result when traditional strategies combine with the multimedia and when they are combined with group strategies.
KEYWORD: *teaching strategies, multimedia, traditional teaching, quasi-experimental*

INTRODUCTION
Problem and Its Background
Teaching strategies are crucial for effective learning, with teachers playing a vital role in shaping students' knowledge and skills. Traditional teaching methods, where teachers take a central role in instruction, have been used for years, as defined by Tularam (2018). However, modern approaches incorporate multimedia elements to enhance the learning experience, utilizing various media forms like text, images, audio, and video to engage students.

In Nigeria, there are concerns about poor academic performance in certain regions, indicating potential challenges in instructional delivery (Olowo et al., 2020). Similar challenges exist in India, where overcrowded classrooms hinder traditional teaching (World Class Education For Your World, 2022). The COVID-19 pandemic has also impacted education globally, forcing teachers to explore alternative methods due to restricted face-to-face learning (Valdez, 2010). In some regions in the Philippines, limited access to electricity and internet restricts the use of multimedia platforms, affecting students' ability to cope with such teaching methods.

Locally, at Camanlangan National High School, teachers face challenges in utilizing multimedia platforms due to poor internet connectivity and limited tech-literacy. The researcher of the school aims to investigate the impact f multimedia platforms on student achievement, recognizing the significance of effective teaching strategies in enhancing learning outcomes.

Statement of the Problem
This study aimed to determine the relationship of using multimedia as teaching strategy and the academic achievement of the students in Camanlangan National High School in New Bataan District for school year 2022-2023. Specifically, it sought to answer the following questions:

1. What is the level of academic achievement of the students in control and experimental groups as reflected in their pretest?

2. What is the level of academic achievement of the students in control and experimental groups as reflected in their posttest?

3. Is there a significant difference between the posttest of the control and experimental groups?

METHODS
Research Design
This study used the quantitative quasi-experimental design with two-group pretest/ posttest design. It used the scientific method to establish the cause-effect relationship among a group of variables, specifically two-group pretest/posttest design group of which a pretest then followed by the intervention and then posttest. The dependent variable of the study was observed in experimental as well as control groups before the intervention.

While the experimental group received treatment following which the posttest observation of dependent variable was carried out for both the groups to assess the effects of the intervention or treatment on experimental group (Jaikumar, 2018). It involved the manipulation of the independent variable to observe the effect on the dependent variable. It was generally used to establish the causality in situations where researchers were not able to randomly assign the subjects to groups for various reasons.

Subjects of the Study
The subjects of this study were the 70 Grade 8 students of Camanlangan National High School. They were purposively selected from the two sections of Grade 8 where the researcher is currently handling Mathematics. The students were grouped heterogeneously to make sure those who were high, average, and low performing were equally distributed in each of the sections and to make sure that no one is better than the other. The duration of intervention is 30-days. The grade 8 section Gumamela was the experimental group while section Cattleya was the control group. The researcher also conducted a pilot testing beforehand with the remaining two sections of the grade level, that to identify problems before implementing it, also to examine the validity of each question.

Table 1
Subjects of the Study

GROUP	Number of Students	Percentage (%)
Control (Group A)	35	50
Experimental (Group B)	35	50
TOTAL	**70**	**100**

Table 1 shows the total number of students in each group and their corresponding percentages. Group A as control group and Group B as experimental group. A total of 36 male students out of 70 respondents of the study.

Research Instrument
A forty-item test was prepared by the researcher for the pretest and posttest for both control and experimental groups. The coverage of the test was taken from the competencies during the third quarter. To equally distribute the questions based on the level of difficulty, the researcher prepared a table of specifications considering the six levels of cognitive domain: knowledge, comprehension, application, analysis, synthesis and evaluation.

Validation of the Research Instruments
The research instrument which was the teacher-made pretest-posttest was submitted to the researcher's validators and research adviser for comments and suggestions, which was used in this study. After validation, the pretest-posttest underwent pilot testing to the two remaining sections of the grade level the Sunflower and Sampaguita of Camanlangan National High School, who were set as the respondents.

The pretest-posttest was scrupulously organized, and it included the presentation of the Table of Specification (TOS) to ensure that the test items were distributed properly.
Students who were not in the control and experimental groups were given the preliminary questionnaires to complete.

Research Procedure
The following procedure will be followed during the conduct of the study:

Asking permission to conduct the study. The researcher wrote a letter of permission addressed to the Schools' Division Superintendent and once approved another letter was prepared for the principal of Camanlangan National High School to formally ask her permission to conduct the study. After the approval, the researcher immediately began her experimentation using the two sections in Grade 8 as her subjects of the study.

Conducting Pretest. The researcher conducted a forty-item pretest to the control and experimental groups to determine their compatibility for the study and their prior knowledge.
Intervention Period. The researcher used the multimedia as the strategy in teaching Mathematics as the intervention for 30-days. Lesson plans were prepared during the intervention phase for about four weeks and a daily journal was written in monitoring the activities performed by the students.

Conducting Posttest. The researcher conducted a 40-item posttest after the intervention to determine whether there was a difference on their performance in Mathematics after the use of multimedia in teaching the subject. The results were subjected to statistical computations and after which, the results were analyzed and interpreted.

Statistical Tools
In the computation of the data and testing the null hypotheses of the study, the Statistical Package for Social Sciences (SPSS) and the following statistical tests were used.

Mean. It indicates how are the scores of pretest and posttest were distributed around the central part of distribution.

Paired t-test Independent. It was used to compare or measure the means of control and experimental group.

RESULTS

This chapter presents the results obtained from the collected and the subsequent analyses in a sequence corresponding to the problems presented. Data and preliminary information were also provided as basis of the computation and interpretations of the results. These results were computed through SPSS software.

Level of Academic Achievement of the Pretest Scores of the Groups

Table 2 shows the results of academic achievement of the students pretest scores of the control and experimental group.

Table 2
Level of Academic Achievement of the Pretest Scores of Control and Experimental Group

Pretest	No. of Students	Mean	Class Proficiency	Competency level
Group A (Control)	35	14.5	36.25%	Did Not Meet Expectation
Group B (Experimental)	35	14.9	37.25%	Did Not Meet Expectation

The above shows the level of performance of the students before the study of the two groups. The mean of control group was 14.5 and the mean experimental group was 14.9. The class proficiency shows that the control group got 36.25%, and the experimental group got 37.25%, but both groups did not meet the expectation level. It means that, both the respondents of control and experimental groups did not show or demonstrate competence in relation to the lesson or topics.

Level of Academic Achievement of the Posttest Scores of the Groups

Table 3 shows the results of the academic achievement of the students' posttest scores from the control and experimental group.

Table 3
Level of Academic Achievement of the Posttest Scores of Control and Experimental Group

Posttest	No. of Students	Mean	Class Proficiency	Competency level
Group A (Control)	35	18.6	46.5%	Did Not Meet Expectation
Group B (Experimental)	35	20.6	51.5%	Did Not Meet Expectation

The above table shows the level of performance of the students after the study of the two groups. The mean of control group was 18.6 and the mean of experimental group was 20.6. The competency level shows that both groups still did not meet the expectation. This would signify that after the intervention, still the respondents did not reach the expected level of competence for the specified lessons or topics. This could also mean that there might be different factors that hinders them to reach the expected learnings after the said intervention.

Significant difference between the posttest mean scores of the students in control group and the experimental group

Table 4 shows the results of the computations to compare the achievements of the students between the control and experimental groups as reflected on their posttest scores.

Table 4
Comparison of the Achievement of the Students between the Control and Experimental Group

Posttest	No. of Students	Mean	t-value	p-value	Remarks
Group A (Control)	35	18.6	-0.154	0.137	Not significant
Group B (Experimental)	35	20.6			

Table 4 shows the level of performance of the students after the study of the two groups. An independent t-test was conducted to test if there is significant difference between the posttest of control and experimental group.

The mean indicates that Group A (Control) got 18.6 and Group B (Experimental) got 20.6. The P-Value is 0.137 greater than 0.05, indicating that there is no significant. Therefore, the null hypothesis was not rejected and there was no significant difference between the achievements of the students in the control and experimental group as reflected on their posttest scores.

DISCUSSIONS AND CONCLUSION

This chapter presents the discussions, conclusion and recommendations of the conducted research study. The sequence of the presentation and the organization of the findings were based on the problems presented.

Discussions

Academic Achievement of the Pretest Scores of Control and Experimental Group. In the pretest scores of control and experimental group showed low mastery levels in the subject with class proficiency below 75%, likely due to disruptions caused by the COVID-19 pandemic. To address this, the researcher incorporated multimedia in the experimental group and used a traditional approach in the control group.

According to John Locke, in his theory "tabula rasa" or "blank slate" suggests that students gain knowledge through experiences and reflection. However, the pandemic has created challenges in coping with educational gaps. Teaching is a significant responsibility that requires collaboration and cooperation among teachers, students, and stakeholders. Effective teaching strategies are essential for engaging students and fostering a positive learning experience.

Academic Achievement of the Posttest Scores of Control and Experimental Group. Based on the result of the posttest of the control and experimental group both groups exhibited increase in their means. The mean of control group was 18.6 showed an increase of 4.1 from its' pretest mean 14.5. The mean of experimental group was 20. showed an increase of 5.7 from its' pretest mean 14.9. It implied that after the teacher conducted intervention both traditional and using multimedia instruction, students' showed improvements when it comes to their learnings.

The Theory of Trauma by Ulman and Brother' (1998) posits that traumatic experiences can shatter an individual's sense of self, leading to intolerable disruptions. Natural disasters, like earthquakes, can have strong negative effects on people's lives, causing physical, economic, and social losses. Such events are beyond our control, interrupting normal life and activities.

In the aftermath of an earthquake that affected our area, face-to-face classes were interrupted due to safety concerns, leading to a shift to blended modular learning with multimedia instruction. However, the trauma experienced by students, including fears of losing homes and lives, and the unpredictability of ground movements, impacted their ability to focus on studies.

Academic Achievement of the Students between the Control and Experimental Group. In the comparison of the achievements of the students in control and experimental group, it implied that the null hypothesis was not rejected and there was no significant difference between the achievements of the students in the control and experimental group as reflected on their posttest scores. The control group utilized traditional instruction while the experimental group used multimedia instruction.

In addition, the use of PowerPoint, posting educational videos and any other multimedia in teaching were found to be effective in aiding teaching-learning process. As pointed out by Lari (2014), the usage of PowerPoint presentations resulted to a positive significant effect on the learners' achievement on test scores. Using PowerPoint presentations further resulted to a better understanding of the lessons as well as in motivating the learners. Meanwhile, on the analysis of the posttest, result revealed that through acquiring or aiding multimedia in teaching the mean scores of academic achievements had increased. This result signified an improvement of the learners' academic achievement during the posttest with the intervention of traditional and multimedia tools in teaching.

Thus, it can be concluded that social media have a dual impact on student achievement, and it is necessary to approach adolescents' use of social networks with ultimate responsibility (Talaue at al., 2018).

According to the study of Abdulrahaman et al. (2020) that several studies investigated the impact of ICT to education stated that multimedia technology has positive impact on the way teachers impart knowledge and the manner in which learners comprehend the subject matters. In addition, they revealed that multimedia tools have been developed to enhance teaching and learning for various field and multimedia tools were delivered using different technologies.

In addition, Da'lij (2008) as cited in Aloraini (2012) conducted a study entitled as ''The effect of using Mathematics software produced locally on second grade intermediate female students' academic achievement in Riyadh''. The study aims to identify the effect of using multimedia software produced locally on second grade intermediate female students' academic achievement in mathematics. The study sample consisted of 70 female students divided equally into two experimental groups studying by the locally produced software and a control group studying the traditional method. The study revealed no statistically-significant differences at the significance level of 0.05 between the experimental and control groups.

Furthermore, in the study in Kogi State University found out that the exposure of the students to multimedia have effect on their academic performance. Evident show that social media have negative influence on the academic performance of students. Students who spend more time on multimedia like social media are likely to perform poorly in their academics this is because instead of reading books, they spend time chatting and making friends via social media and this will definitely bring negative effect on their academic performance (Asemah & Okpanachi, 2013).

Conclusion

The academic achievement of both the control and experimental groups before the intervention shown in the computation of their class proficiency in their pretest scores. The academic achievement of the students in both control and experimental group showed improvement in terms of their means as shown in their posttest scores. But, the result implied there is no significant difference between the academic achievement of the two groups, thus, it can be concluded that both control and experimental groups improved using traditional teaching and using multimedia instruction in terms of their means but still did not meet expectation at their

proficiency level with the reasons mentioned above. The results showed that both approaches were effective in the teaching-learning processes during given thirty-day intervention. The result could also be mean that combination of traditional instruction and multimedia would enhance and give more improvements on the students' learning.

The results implied that the combination of traditional and using multimedia in teaching can be beneficial in teaching-learning process and they have shown a better result when traditional strategies combine with the multimedia and when they are combined with group strategies.
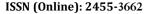
Recommendations

Based on the conclusions derived from the findings of the study, the following recommendations are hereby presented:

1. There is a need for the teacher to engage in different kinds of teaching approaches to address the different needs of the students.
2. Teachers must be creative in delivering the lesson, in a way that students can actively participate and cooperate.
3. The school administrators should encourage and support the teachers for skills' training or any other trainings connected to teaching.
4. Expansion in using multimedia in teaching and be open to any available training courses to the teachers regarding the use of multimedia.

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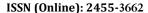   https://doi.org/10.1186/s40561-020-00118-7.
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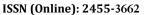
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